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28 March 1980

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 36



FOREIGN BROADCAST INFORMATION SERVICE

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CAIRO RADIO COMMENTS ON ISRAELI NUCLEAR ACTIVITIES

NC221420 Cairo Domestic Service in Arabic 1230 GMT 22 Feb 80 NC

[Mahmud Mitwalli commentary]

[Text] Everyone is well aware of Israel's public and secret attempts to possess atomic bombs. Israel's cooperation with certain European countries and with South Africa in particular has been obvious.

Israel took possession of a uranium shipment, which led to an argument among many Arab scientists, particularly in Egypt. Israel then began to raise its voice stressing that Israel no longer feared the enormous Arab population because Israel was producing atomic bombs. Egypt's decisive answer at the time was that Egypt was able to obtain atomic bombs. This gradually silenced the Israeli hawks because Egypt was serious. The Israelis know that Egypt can produce such bombs with the help of its friends.

However, last September near South Africa's coasts a U.S. satellite recorded a glare similar to a nuclear explosion. This has again brought to the fore the issue of the Israeli atomic bomb, particularly since the American CBS news confirmed this report quoting reliable sources. Commenting on this report, CBS news tried to corroborate its report with testimony from Israel, presenting a copy of a book written by two Israeli reporters. The two Israeli reporters confirmed that Israel has a nuclear arsenal. This arsenal was produced with the help of uranium shipments from the South African Government under an agreement concluded after 1957. There is technical cooperation between South Africa and Israel under which Israel provides expertise to the Pretoria government and the latter gives uranium to Israel. This agreement is still valid although Israel does not depend solely on South Africa for uranium supplies. Certain European and U.S. organizations have also provided Israel with nuclear support.

We stress--if we are to assume that this explosion that took place near Africa's coasts was an Israeli nuclear explosion--that this means that Israel is joining the small atomic club by producing a Hiroshima-style bomb.

Since Egypt is currently making courageous steps toward peace, it is not in the interest of the Middle East to become a zone of nuclear conflict. Egypt insists that Africa and the Middle East must be free from atomic weapons. However, we must not remain silent and rely on intentions. The Arabs must understand history and keep up with the current of time. Let the Arabs understand that the battles with Israel are fierce and ferocious and require a unified stand. What is the use of "ifs" after history has decisively settled this conflict. Israel must realize the reality of the age in which it is living. It is not in Israel's interest to possess atomic bombs at a time when it is proceeding toward or seeking peace in order to exist. Atomic bombs will not give Israel security. What Israel can do, others may also be able to do, thus endangering peace. Egypt will not allow such trends or intentions, but will confront them out of its faith in its mission.

WORLDWIDE AFFAIRS

ISRAEL REPORTEDLY 'IN POSSESSION OF NUCLEAR WEAPONS'

LD221106 Moscow TASS in English 1048 GMT 22 Feb 80 LD

["Dangerous Alliance"--TASS headline]

[Text] Washington, February 22, TASS--An explosion which occurred in the Atlantic Ocean off the South African coast on the night of September 22-23 last year was a result of Israel's nuclear tests. This was announced by the American CBS television network which managed to determine the cause of the unexplained explosion detected by a U.S. satellite at that time.

Quoting informed sources, CBS reported that despite the denial of the South African authorities of their involvement in the explosion, they gave assistance to and cooperated with Tel Aviv in conducting the tests.

CBS also obtained irrefutable evidence that Israel has been in possession of nuclear weapons for many years and that this is well-known to its overseas patron--the United States. A CBS correspondent received an opportunity to familiarise himself with the content of a book written by the Israeli journalists Eli Teicher and Ami Doron which contains a detailed account of the history of development of nuclear weapons by Tel Aviv. The book was submitted to the Israeli military censor and it is not known in what shape it will be published. The CBS correspondent pointed out that research work in the field of nuclear energy, mainly for military purposes, is being conducted at the Israeli research center in the southern Negev Desert. South Africa supplies Israel with uranium in exchange for results of research.

These facts allow the observers to suggest that the South African racists are also in possession of atomic weapons. It is absolutely clear that the entire responsibility for the development of nuclear weapons by these two reactionary, expansionist countries rests with the Western powers, primarily with the United States. Hundreds of specialists from Israel and the Republic of South Africa were trained at American enterprises connected with nuclear research. There is evidence of secret "leakage" of nuclear technology and big consignments of enriched uranium from U.S. centers to Israel.

The fresh exposure of the nuclear ambitions of Israel and South Africa, as well as criminal complicity on the part of the Western states, give rise to serious concern of the peoples of Africa and the Middle East, of the entire world public.

CSO: 5100

USSR ARMY PAPER TRACES PAKISTAN'S PROCUREMENT OF NUCLEAR MATERIAL

ID201555 Moscow KRASNAYA ZVEZDA in Russian 16 Feb 80 p 3 ID

[Capt V. Roshchupkin "International Remarks": "Dangerous Pretensions"]

[Text] It happened not so long ago in a desert locality in Niger. A group of nomads accidentally discovered an overturned truck. There were no cargo and no people in the vehicle. As it became clear, this was the very same truck that, after leaving a mine in Arlit with 20 tons of uranium concentrate, "disappeared without trace." The report of the nomads' find disturbed many press organs. Meticulous reporters managed to establish that the traces of the "missing" uranium led to...Pakistan. This was reported in particular, by the journal LETTRE D'AFRIQUE, published in Paris.

The French company (Kozhema), which controls Niger's uranium mines, hurried to state that there had been no theft of uranium; the truck had merely had an accident. But faced with the facts, the company later admitted that in 1979 more than 400 tons of uranium ore was sold to Pakistan. Why did Islamabad need it?

Reports have appeared more than once in the foreign press to the effect that work on creating a nuclear weapon is under way in Pakistan. Britain's DAILY TELEGRAPH even indicates the proposed site for a proposed underground nuclear test--the desert regions of Baluchistan. The press notes that Pakistan intends to carry out such a test as early as April of this year.

As is known, you can create an atom bomb if you have the necessary quantity of pure uranium or plutonium. The rest is a matter of technology. As for the uranium ore, until recently it was not quite clear from where Pakistan procured it. The story of the truck which the nomads found in the Niger desert cast light on this circumstance.

And the technology? To make this clear, we must dwell on the figure of one (Abdol Kader) Khan, whose name is frequently mentioned by the foreign press now. This Pakistani engineer is heading the construction of a uranium enrichment plant in the Pakistani city of Kohat. There, judging from press reports, uranium could also be produced for military purposes. Earlier, according to France's LE NOUVEL OBSERVATEUR magazine, Doctor Khan managed to obtain access to the technology of uranium enrichment in the West German-Anglo-Dutch Urenco Consortium. It was he who organized purchases of the necessary industrial equipment, particularly in Britain.

LE NOUVEL OUVRIER, telling readers how Khan collected the necessary technical information, called him "one of the most talented spies of our times." But it is not a question of his merits as a spy. Islamabad's nuclear pretensions became possible through the connivance of imperialist circles in certain Western countries.

In this connection attention is drawn to the U.S. proposal to resume military aid to Pakistan. That step, the Washington POST newspaper wrote recently, will give Pakistan the "opportunity to use its formerly restricted resources to fulfill the previously banned nuclear program."

As is known, China has also harnessed itself to Pakistan's nuclear chariot. A relevant agreement between Islamabad and Beijing was signed as early as 1976. It should be stressed particularly that the Maoists, according to the DAILY TELEGRAPH, extended the framework of aid to Pakistan in its nuclear plans after the victory of the April revolution in Afghanistan.

Islamabad's dangerous pretensions are arousing deep concern in India and other neighboring states and among all who value peace, security and political stability in Asia.

CSO: 5100

WESTERN WILLINGNESS TO SUPPLY ARMS TO PAKISTAN NOTED

LD291000 Moscow TASS in English 0743 GMT 29 Feb 80 LD

[Text] Moscow, February 29, TASS --TASS commentator Nikolay Rybakov writes: Seeking to create a springboard in the Middle East for the suppression of the anti-imperialist struggle of the peoples of the whole region, the governments of the USA and its allies give military aid to Pakistan and use the territory of that country for provocative actions against neighbouring Afghanistan. Western countries one after another offer weapons and military hardware to Pakistani leaders. Thus, Washington stated that it will give 400 million dollars worth of military and economic aid to Islamabad. However, according to U.S. mass media, military deliveries to Pakistan may be increased up to 1,000 million dollars. British Foreign Secretary Lord Carrington during his visit to Islamabad also discussed the question of deliveries of arms for the Pakistani Army. According to reports of the newspaper PAKISTAN TIMES, similar services are now being offered by France.

As stated by Olivier Stirn, secretary of state to the French minister of foreign affairs, who visited Pakistan, France is prepared to increase its economic and military aid to Pakistan by 150 million francs in addition to the aid already assigned for the year 1980 to the sum of 250 million francs. According to him, France is ready to supply Pakistan with 50 instead of the ordered 32 Mirage fighter planes and to give aid to the Pakistani Navy. Olivier Stirn also said the French Government did not give a categorically negative answer to the question of delivering equipment to Pakistan for a plant to produce nuclear fuel. But already the fact that talks on nuclear fuel were held during Stirn's visit serves as another confirmation of plans for the creation of Pakistan's nuclear flank. For many years Pakistan has been seeking to create an atom bomb of its own. As the New York TIMES newspaper pointed out, the construction of a plant to produce enriched uranium is being conducted at an accelerated pace on the outskirts of Islamabad.

About a year ago Washington suspended military aid to Pakistan in view of the fact that work to create nuclear weapons is conducted in the country. The USA explained that by necessity to strengthen the regime of non-proliferation of nuclear weapons. However, after the failure of Washington's plans to turn Afghanistan into a U.S. military place d'armes, the USA hurried to resume military aid to Pakistan without showing the least concern as to what consequences that will entail from the viewpoint of the nuclear ambitions of the Pakistani military regime. The massive deliveries of arms to Pakistan by the United States and some of its allies as well as by Beijing are intended for the arming and support of Afghan counterrevolutionaries that found refuge in Pakistan's territory and for conversion of Pakistan into imperialism's military stronghold after the collapse of the shah's regime.

The practical refusal by the USA and other Western countries to see to the observance of the nuclear non-proliferation regime in application to Pakistan is fraught with very dangerous consequences, first of all, to its neighbours which are legitimately concerned over Pakistan's work in the nuclear field. Islamabad's military preparations are bringing about a threat to peace and stability in south West Asia, and are aggravating still more the situation in the region which has already been strained as a result of the increase in U.S. military presence there.

PAKISTAN 'SPEEDING UP' NUCLEAR WEAPON DEVELOPMENT

LD282122 Moscow TASS in English 2044 GMT 28 Feb 80 LD

[Text] New York, February 28, TASS --Pakistan is speeding up the development of its own nuclear weapons. According to today's New York TIMES quoting official representatives of the U.S. State Department, the Carter administration has at its disposal information that Pakistan goes ahead with the construction near Islamabad of a plant for the production of enriched uranium which can be used for nuclear weapons. According to U.S. intelligence sources, writes the newspaper, Pakistan will be able to produce its nuclear bomb as early as next year.

Some time ago the Washington administration expressed its "concern" over Pakistan's nuclear program and used the issue to stop large-scale military and economic aid to Islamabad. Yet today Washington, which is using the Pakistan territory for interference in Afghanistan and the sending of banks of armed mercenaries across the Afghan border, brushed aside all its principles and prefers not notice the dangerous consequences of Islamabad's nuclear preparations. The White House took a decision to give Pakistan broad military and economic aid worth 400 million dollars. The New York TIMES writes that the U.S. administration today is no longer as concerned as previously over Pakistan's nuclear program.

CSO: 5100

WIEZMAN DENIES U.S. REPORT ON NUCLEAR TEST

U.S. Report

TA220652 Jerusalem Domestic Service in English 0500 GMT 22 Feb 80 TA

[Text] U.S. State Department officials have reacted with skepticism to a CBS report saying that Israel tested a nuclear device in South Africa last September. The CBS reporter in Tel Aviv, Dan Raviv, filed the story from Rome. It dealt with an as yet unpublished book by two Israelis on the history of atomic weapons production in Israel. Raviv said unnamed informed sources had confirmed to CBS that Israel exploded a nuclear device in South Africa last year with the help of that country's government.

A State Department spokesman told our reporter, Connie Lonn, in Washington that there was no evidence of that at all. He said that an investigation by the best American scientists had failed to conclude that mystery signals picked up by satellites in September were even caused by a nuclear explosion at all.

In a reaction just in: Defense Minister Ezer Weizman says that there is no truth or foundation at all to the CBS allegation.

South African Denial

TA220912 Jerusalem Domestic Service in Hebrew 0900 GMT 22 Feb 80 TA

[Excerpt] The South African Government has completely denied the report published in the United States last night about a nuclear experiment conducted by Israel, about 6 months ago, in cooperation with South Africa. This is an unfounded report, said Chairman of the South African Atomic Energy Committee Dr Dawid de Villiers in a telephone conversation with our correspondent Oded Ben-'Ami.

CSO: 5100

'KUNA' REPORTS SAUDI-FRENCH DEAL FOR NUCLEAR REACTOR

LD200952 Kuwait KUNA in Arabic 0721 GMT 20 Feb 80 LD

[Text] Kuwait--The Kuwaiti AL-ANBA says today that France has agreed to supply the Kingdom of Saudi Arabia with a nuclear reactor and sophisticated weapons in return for Saudi oil concessions. It says that French Premier Raymond Barre will be holding talks "in great secrecy and gravity" when he visits Saudi Arabia next Saturday.

AL-ANBA says that the kingdom has asked France to build it a nuclear reactor for peaceful purposes and that France has agreed in principle to this request, but is awaiting the completion of talks during Barre's visit.

The paper quotes other French sources as having said that France has been trying to convince the Gulf states to accept Western military protection against any "Soviet invasion." It says that the French president, Giscard d'Estaing, who will visit the Gulf during next March, will try to convince countries of the region who have reservations about American military presence that its purpose is to protect world peace and to protect the countries of the region against any outside aggression. It adds that France will offer to take the place of the United States in protecting the Arabian Gulf region if they were exposed to outside attack.

CSO: 5100

INDIAN DELEGATE ON NONPROLIFERATION SPEAKS AT VIENNA MEETING

BK281021 Delhi ISI Diplomatic Information Service in English 0839 GMT 28 Feb 80 BK

[Text] India has expressed the view that nonproliferation measures must be applied universally and without discrimination to all nuclear activities in all states in order to be fully effective, reports PTI.

In a speech prepared for the final plenary of the conference of international nuclear fuel cycle evaluation at Vienna on February 26, Indian Delegate K.R.P. Singh said that vertical and horizontal proliferation had to be dealt with simultaneously and with equal seriousness. Some of the measures which were being discussed for the prevention of horizontal proliferation would only lead to the perpetuation of vertical proliferation.

He said institutional measures to confine certain fuel cycle activities, either to territories of the nuclear weapon states or to areas under their effective control and supervision, would be tantamount to a surrender of national sovereignty by the vast majority of countries while enabling a chosen few to effectively dictate a programme which they deem to be appropriate for peaceful utilisation of atomic energy in other countries.

CSO: 5100

AUSTRALIA, FRANCE STUDYING JOINT URANIUM ENRICHMENT PROJECT

OW270815 Hong Kong APP in English 0712 GMT 27 Feb 80 OW

[Text] Sydney, Feb 27 (AFP)--France will begin a feasibility study immediately on a cooperative scheme with Australia for the enrichment of uranium in Australia for use in France. The first steps in a possible new deal have emerged from the visit of the French delegation on uranium enrichment headed by Monsieur Jacques Devilliers.

At a press conference today, the delegation announced that they had completed discussions with the deputy prime minister and minister for trade and resources, Mr Doug Anthony, and the minister for national development, Senator John Carrick. Following these talks the technical questions have been discussed with the Uranium Enrichment Group of Australia (UEGA), formed this month by Australia's leading companies--Broken Hill Proprietary, Colonial Sugar Refineries (CSR), Peko-Wallsend and Western Mining Corporation. The UEGA has agreed to keep in touch with the French industry on both Uranium development and nuclear power.

The feasibility study is expected to last from 12 to 18 months in an effort to prove that the French techniques for enrichment are safer, cheaper and more efficient than any other system available. In Canberra, among government officials, it is believed that if this feasibility study is successful in proving the superiority of the French methods, a satisfactory deal about uranium supplies for French energy can be worked out. A permanent representative of the French delegation from the Commissariat a l'Energie Atomique, Monsieur Michel Mezin, will be established in Sydney. This will enable the French Atomic Energy Commission, the Australian Government, the Australian mining companies and the French diplomatic representatives to keep in constant touch.

CSO: 5100

SOVIETS EXPERTS AID IN ARGENTINE NUCLEAR TUBE MANUFACTURE

PY160037 Rio de Janeiro JORNAL DO BRASIL in Portuguese 15 Feb 80 p 19 PY

[By correspondent Rosenthal Calmon Alves]

[Excerpts] Buenos Aires--Vice Adm Carlos Castro Madero, chairman of the Argentine National Atomic Energy Commission, has said that Argentina may supply special seamless [zircaloy] tubes earmarked for carrying uranium pellets in Brazilian nuclear plants within the framework of the overall cooperation system which is being negotiated between the two countries.

The factory to make these special tubes is being built at Ezeiza, near Buenos Aires, under the technical advice of Soviet experts. This is the only known case of Moscow's cooperating with the Argentine nuclear program which, like the Brazilian nuclear program, has been the target of U.S. pressure.

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WORLDWIDE AFFAIRS

BRIEFS

ROMANIA AT VIENNA MEETING--Vienna, AGERPRES, 28/2/1980--Taking the floor during the general debates of the final plenary conference of the nuclear fuel cycling evaluation programme, the head of the Romanian delegation, Octavian Groza, reiterated Romania's stand regarding all countries' right to fully benefit from the peaceful use of nuclear science and technology. Romania--he said--considers it imperiously necessary that an unhampered access, without discrimination, to the achievements of nuclear science and technology for peaceful purposes should be ensured. The developing countries, in particular, should be granted the necessary technical assistance. [Text] [AU282043 Bucharest AGERPRES in English 1930 GMT 28 Feb 80 AU]

UN OBSERVER ON ISRAELI NUCLEAR TEST--The United Nations--The news reports on the nuclear explosion carried out by Israel and South Africa near the South African coasts have aroused the concern of Arab and world quarters. Zuhdi at-Tarazi, PLO permanent observer at the United Nations, told a TASS correspondent that there is nothing unexpected in the two racist regimes cooperation in the production of nuclear weapons. He added: We have information showing that Israel and South Africa began preparing for a nuclear test long ago. It will be recalled that in December of last year the UN General Assembly strongly denounced all of Israel's attempts to manufacture, possess, store, test or introduce a nuclear weapon into the Middle East region. The UN General Assembly also called on all countries to stop any sort of cooperation with Israel that might help it possess or design nuclear weapons. [Text] [JN291256 Damascus Domestic Service in Arabic 1215 GMT 29 Feb 80 JN]

CSO: 5100

FORECAST ON JAPANESE-AUSTRALIAN URANIUM TRADE IN DOUBT

Melbourne THE AGE in English 12 Jan 80 p 1

[Report from Nigel Wilson]

[Text]

CANBERRA. — Japan will not place big new uranium contracts with Australia until about 1990, according to the latest Federal Government estimates.

This contradicts previous predictions that during the 1980s Japan would be an important market for Australian uranium.

The Government forecast emerged yesterday as Australia was preparing to welcome the Japanese Prime Minister, Mr. Ohira.

It is understood that the Government believes that, at best, Australia will win only small commercial contracts in the early part of the decade.

There is an outside chance that big contracts could be signed late in the 1980s.

But the forecast was challenged yesterday by senior uranium company officials, who claimed that new contracts were likely to be signed before June.

They emphasised that the contracts would be for delivery in the mid to late 1980s.

An official forecast of Australia's likely sales to Japan has never been released but, based on evidence to the Fox inquiry into the Ranger uranium project, Japanese demand from 1985

was expected to be several thousand tonnes, much of which would have been supplied by Australia. The Fox report put world uranium demand at between 80 and 100,000 tonnes by 1985.

But the Government's latest forecast takes into account the rapid slowdown of Japan's nuclear power station programme and the possibility that Japan might place orders elsewhere before coming back to Australian companies.

One suggestion is that Japan may concentrate on buying from South Africa because of the potential instability of sources of supply.

But to counter that there is also a suggestion that Japan may exercise clauses in existing contracts with other countries which would allow it to take only a minimum amount under these arrangements.

This would give Australia an earlier entry into the Japanese market.

The Government's forecast assumes some importance because of the likelihood that Mr. Ohira will be asked by the Prime Minister, Mr. Fraser, about Japan's apparent reluctance to sign a nuclear safeguards treaty with Australia.

Under Government policy, signing the agreement is a precursor for any new contract.

AUSTRALIA

AUSTRALIA MOVES TO BUILD URANIUM ENRICHMENT PLANT

Queensland, South Australia Compete

Canberra THE AUSTRALIAN in English 27 Dec 79 p 3

[Report by Errol Simper, Ted Knez and Max Jessop]

[Text]

THE race to house Australia's first, and probably only, uranium enrichment plant has developed into a full-scale commercial war between Queensland and South Australia.

Political leaders in both States have dug in their heels and it is likely the Federal Government will have to arbitrate on which, if either, lands what would be a multi-million-dollar project.

The French Atomic Energy Commission is negotiating with the Queensland Government for a \$5000 million plant near Townsville, while the French Urenco-Centec consortium has held talks with the South Australian Government about an operation costing about one-tenth as much.

Both nuclear interests are wooing the States involved, promising to generate additional jobs and industrial development if allowed to build an enrichment plant.

The situation could be complicated even further in the next few days by the Western Australian and Northern Territory governments, and by Japanese interests.

NEEDED IN 1995

Western Australia and the Northern Territory would like

to build such a plant. The West Australian Minister for Fuel and Energy, Mr Mensaros, has said the State will need atomic energy by 1995.

In October the Commonwealth announced it had submitted to the Japanese Government terms of reference on a joint feasibility study for building an enrichment plant.

The Deputy Prime Minister, Mr Anthony, has discussed the project with the president of the Federation of Electric Power Companies of Japan, Mr Gaishi Hiraiwa.

But yesterday Queensland and South Australia were confident they had left the field — and each other — behind in what could be a bitter, protracted, federal election controversy.

The South Australian Minister of Mines and Energy, Mr Goldsworthy, claimed Federal Government support for his State, while the Queensland Premier, Mr Bjelke-Petersen, said his was the only State to demonstrate it was able to load uranium.

Mr Bjelke-Petersen also claimed Queensland was politically more stable than its rival and clearly had the "brightest future".

Mr Goldsworthy said last night: "Joh just wants to get in on the act, but we're way out in front."

He understood the Federal Government had signed an

agreement with Urenco-Centec, appearing to ally itself with his State.

Mr Goldsworthy said the Tonkin Government in South Australia was still studying submissions from Urenco-Centec and expected to make a decision within the next 18 months or two years.

South Australia's Liberal Government has itself signed an agreement with Urenco-Centec, allowing further studies to be held on the establishment of a plant, and is claiming this puts it further ahead of Queensland.

The agreements ensure that certain technical and commercial information will remain confidential.

But Mr Bjelke-Petersen yesterday retorted: "It is good to hear that South Australia has such an optimistic outlook, particularly on Christmas Day.

"But the plain fact is that it will be the French who will make the decision where the enrichment plant is going and we have every reason to believe they will decide on Queensland.

"They know full well that Queensland is the most rapidly developing State and has the greatest uranium

"They also know that it has had a National-Liberal Party coalition since 1957 and things will certainly stay that way.

"South Australia, on the other hand, has had several changes of government in the period and it's far more politically volatile."

Mr Bjelke-Petersen said Queensland was the only State that had demonstrated an ability to load uranium.

"We have been loading Malcolm Fraser's uranium for him for ages," he said.

"All these factors will be taken into consideration by the French and from our talks last week we feel every reason to be supremely confident that the uranium enrichment plant will be built here, creating thousands of jobs for Queenslanders."

It has been estimated that Australia would be able to charge four times as much for enriched uranium — compared with milled uranium oxide — on the international market.

Australia last month made its first uranium export sale since 1972 when it agreed to sell to a South Korean company 2500 short tonnes of

uranium oxide for \$160 million — \$64,000 a tonne.

The Commonwealth generally supports Australia enriching its own vast uranium reserves and it was announced last month that four major Australian companies — Peko-Wallsend, Western Mining Corporation, CSR and BHP — had agreed to a government request for them to carry out a joint assessment of the viability of an enrichment and conversion plant.

The Prime Minister, Mr Fraser, has referred to Queensland and Western Australia as "obvious favorites".

The West Australian Government has had independent talks in the past year with Japanese power authorities about building a plant in the west. It has also had exploratory talks with a consortium of Dutch, British and West German interests.

A complicating factor is that the bulk of uranium ore is in the Alligator Rivers region of the Northern Territory, and the Territory Government has long wanted an enrichment plant built there.

Study Group Established

Sydney THE SYDNEY MORNING HERALD in English 3 Jan 80 p 3

[Report from Andrew Kruger]

[Text] Canberra.--A group of four Australian companies has agreed to look at the possibility of setting up a commercial uranium enrichment industry in the country.

The Minister for Trade and Resources, Mr Anthony, and the Minister for National Development and Energy, Senator Carrick, announced the joint venture by BHP, CSR, Peko-Wallsend and Western Mining Corporation yesterday.

They said the move followed the Government's announcement a year ago that it wanted to encourage the upgrading and processing of raw materials before export.

At the same time the Government said it would study the feasibility of Australia's establishing a commercial uranium enrichment industry.

Yesterday Mr Anthony and Senator Carrick said that during the study, major decisions on a range of complex questions would have to be made by Federal and State governments and private industry.

"As part of this process, a group of Australian companies has agreed to set up a joint venture to be known as the Uranium Enrichment Group of Australia to undertake a pre-feasibility study on the possibility of establishing an Australian commercial uranium enrichment industry."

The Ministers said the Com-

monwealth Government saw a major role for industry in uranium enrichment to provide the maximum economic benefit for Australia.

They said they had also had discussions with URENCO/CENTEC, a European organisation, and with the governments of France, Japan and the US on the possibility of enrichment technology being made available to Australia.

"With some 20 per cent of the world's known low-cost uranium resources Australia is well placed to proceed with uranium enrichment," they said.

"This interest by private industry and the interest shown by the State governments is an indication that considerable economic benefit could flow from the successful establishment of a uranium enrichment industry in Australia."

But they said that there were many aspects, such as the appropriate technology, environ-

mental factors, questions of nuclear non-proliferation and safeguards, the choice of overseas partners and the possibility of multinational participation, to be considered.

It is understood that the companies in the joint venture will look at a scale of enrichment plant which could cost more than \$1 billion, although their spokesmen said it was too early to give any indication of the cost or type of plant.

The executive director of Western Mining Corporation, Mr H. Morgan, said that the project, if it was found to be economically feasible, probably would involve more than one company because of the cost and financial risk.

The deputy general manager of CSR, Dr D. D. Brown, said: "While energy supplies are becoming increasingly important, we think it is right that we should look properly and dispassionately at all the issues of uranium enrichment."

Background to Venture

Melbourne THE AGE in English 3 Jan 80 p 3

[Report from Simon Balderstone]

[Text] Canberra.--The Federal Government officially announced yesterday that a group of Australian companies was to study the possibility of establishing a commercial uranium enrichment industry.

The joint venture, called the Uranium Enrichment Group of Australia, involves PHP, CSR, Peko-Wallsend and Western Mining Corporation.

The Government has also been speaking with Urenco-Centec, a European uranium organisation which wants to build a plant in South Australia, and the governments of France, Japan and the United States.

The announcement yesterday of the four-company study--publicised in the past four months--will add impetus to attempts by three States to win the first uranium enrichment plant.

Queensland, Western Australia and South Australia are pushing to be "the enrichment State". Each claims to be ahead in the race.

The decision on where an enrichment plant will be built rests with the Federal Government.

The States have been wooing overseas enrichment companies and have taken great heart from the enthusiastic approach to local enrichment from the Federal Government.

A year ago, the Government began a general feasibility study into the industry.

Last September, the Prime Minister, Mr. Fraser, said he believed a uranium enrichment plant would, and ought to, be built in Australia.

He said then that at least two States, Western Australia and Queensland, "would dearly love to have the enrichment plant".

Since then, a change of Government in South Australia has seen that State join the race.

The earlier date for enrichment in Australia would be 1990,

about the time the Government expects the depressed enrichment industry to pick up.

In South Australia, Urenco-Centec, a joint British, West German and Dutch group which has built several small enrichment plants, wants to build a \$500 million enrichment plant.

Submission

The company has made a submission to the State Government.

A spokesman for the SA Government said yesterday that since 1974 a uranium enrichment committee had been studying enrichment technology and the possibility of a plant in SA.

The spokesman claimed this committee was a clandestine operation during the Dunstan Government.

The Queensland Government enrichment discussions and last

has also been involved in en-year officials of the French Atomic Energy Commission visited the States, looked at possible sites, and spoke with the Government.

They discussed plans for building a \$5000 million enrichment plant near Townsville.

The Queensland Premier, Mr. Bjelke-Petersen, urged the Federal Government to grant France an export licence, even though France has not signed the Nuclear Non-Proliferation Treaty.

The Government has ruled out the possibility of a government-owned plant.

A clause on 35 per cent local enrichment will be included in any future uranium contracts and Australia will give eight years' notice before enforcing the clause.

Opposition in North

Melbourne THE AGE in English 5 Jan 80 p 21

[Text]

TOWNSVILLE. — Queensland, Western Australia and South Australia are falling over each other to become the nation's uranium enrichment State.

But apart from fighting each other, the State Governments will also have to deal with their poorer cousins in local government.

Queensland's hopes of siting a \$5000 million uranium enrichment plant near Townsville, for example, face stiff opposition from local councillors who plan to declare their shire a nuclear free zone, an increasingly popular move for councils.

The enrichment plant proposal emerged from talks held before Christmas between Queensland's Mines Minister, Mr. Ron Camm, and representatives of the French Atomic Commission.

It has led to a bitter dispute within the Thuringowa shire council which includes Townsville's outer suburbs.

The shire's deputy chairman, Cr. Charlie Moroney, backed by

two others on the 12-member local authority, is pressing for a referendum banning all nuclear industry and ore transport within its area.

Since July the council has been considering a petition signed by more than 10 per cent of the shire's 5000 electors, requesting the special poll.

But the shire chairman, Cr. Dan Gleeson, has described the referendum proposal as a "waste of money". He sought advice from the resourceful Local Government Minister, Mr. Russ Hinze, on ways to circumvent it.

The petition was collected after Mr. Camm indicated that a wholly French-owned company, Minatome Australia Pty. Ltd., would be given permission to develop a uranium prospect 50 kilometres west of Townsville.

Ore from the Minatome mine would be hauled by road through residential areas in the Thuringowa shire.

Cr. Moroney has accused the Queensland Premier, Mr. Bjelke-Petersen, of "political chicanery

with promises of the Burdekin Dam in exchange for accepting their nuclear filth" following Mr. Bjelke-Petersen's linking of output from the Minatome prospect with industrial growth and the siting of an enrichment plant at Yabulu on coastal plains at the shire's northern edge.

Queensland MP Ben Humphreys also claimed the Iranian Government was a major shareholder in French consortiums involved in uranium industry. Mr. Humphreys said he did not relish the prospect of the Ayatollah Khomeini having a say in processing of uranium in the Deep North.

Someone who is relishing the debate about the nuclear industry is the distributor of the nuclear safety movie, 'The China Syndrome'. It seems the movie did not do too well when first shown in Townsville, but it will now be re-run.

CSO: 5100

AUSTRALIA

PRESS REPORTS DEVELOPMENTS, PLANS IN URANIUM MINING

Oil Companies Join Rush

Canberra THE AUSTRALIAN in English 28 Dec 79 p 4

[Report by Ted Knez]

[Text]

TWENTY oil companies, searching for alternative fuels, have joined a rush to grab South Australia's energy stocks - particularly uranium.

According to the State's Minister for Mines and Energy, Mr Goldsworthy, discoveries of oil shale and hydrocarbons have triggered an exploration rush across South Australia. But uranium is still most prized by firms in the energy search.

He said yesterday that almost a third of the State, outside national parks and Aboriginal reserves was being explored for minerals.

About a quarter of the 220 current exploration licences were held by oil companies searching for energy minerals such as coal, oil shale and uranium as part of a global diversification by the petroleum industry.

Two years ago only five oil companies were searching for

minerals in South Australia.

He said about 70 firms were spending \$10 million a year in addition to the \$60 million the joint venture partners in Roxby Downs would outlay in the next three years.

Mr Goldsworthy said more than half of those holding exploration licences in the State were searching mainly for uranium.

"Many companies regard South Australia as a likely site for new discoveries," he said.

"They are encouraged by the recent discoveries and the recognition of a variety of little-tested, geologically favourable areas throughout the State."

He said that on the Stuart Shelf, the search for repetitions of the (Roxby Downs) Olympic Dam-type copper, gold and uranium mineralisation continued steadily.

Mr Goldsworthy said the successes in Western Australia had prompted a nationwide search for diamonds.

Beverley, Honeymoon Deposits

Perth THE WEST AUSTRALIAN in English 17 Jan 80 p 5

[Text]

ADELAIDE: About \$130 million is expected to be spent on developing two major uranium mines in South Australia's far north during the next three years.

The work will be carried out at the Beverley and Honeymoon deposits in the Lake Frome area.

Reserves in the Beverley deposit are estimated at 15,800 tonnes and those at Honeymoon at 3500 tonnes.

The Minister for mines and Energy, Mr Goldsworthy, said after the

State election that the State Government would approve uranium mining at Lake Frome almost immediately.

Production from pilot operations is expected to begin within 12 months.

Mr D. Brunt, of Mines Administration Pty Ltd, operator for the partners in the Honeymoon project, said from Brisbane that the firm was still waiting for State and Federal government approval.

An environmental impact statement had to be carried out and approval had to be given by the Foreign Investment Review Board.

The partners in the deposit are Olin NL, Petromin NL and Western Nuclear Aust. Ltd.

Mary Kathleen Profits

Canberra THE AUSTRALIAN in English 22 Jan 80 p 9

[Text]

MARY Kathleen Uranium Ltd emerged from the dark days of moth-balled plants and uranium export restrictions yesterday when it announced a peak \$17.25 million profit for the 1979 calendar year.

The result was a major improvement for Australia's only uranium producer, which earned a profit of just \$707,000 in 1978 when its renewed uranium production was just beginning to get underway.

Admittedly, no tax provision was required because of past tax losses, but the result is still an indication of profits other Australian uranium miners are likely to make in the fu-

ture when they start up production on a much larger scale.

MKU's sales rose from \$37.7 million to \$61.02 million and production of uranium oxide rose from 608 tonnes to 832 tonnes. The 1979 figure included a final quarter production of 233.7 tonnes.

The result was after interest of \$2.51 million (previously \$440,000), depreciation of \$9.16 million (\$4.66 million) and Queensland Government royalties of \$1.11 million (nil).

Notional tax payable would have been \$10.75 million (\$7.98 million based on a 46 per cent tax rate and a further \$2.77

million tax on non-deductible expenditure), but because of earlier tax losses (16 per cent of \$21.77 million) this was cut to nil.

Earnings a share were equal to 23c (compared with 1c previously), but no dividend will be paid. This is in line with company policy until it overcomes its present heavy borrowing situation.

Earnings were fairly evenly spread throughout the year with the first half producing a profit of \$8.77 million (previously a \$1.46 million loss) and the second an \$8.58 million profit (\$2.17 million profit in 1978).

Commenting on the tax position directors said it was anticipated that the remaining tax losses would be recovered early this year and that tax would then become payable.

"This will substantially lower the profits after tax in 1980 and for the remaining life of the mine," they said.

They added that the installation and commissioning of the two radiometric ore sorters at Mary Kathleen was completed during the fourth quarter.

Commenting on legal action taken by the Westinghouse Electric group in the U.S. against MKU and several

other uranium mining companies directors said an earlier decision against the defendants by a U.S. court was still subject to appeal.

"It is understood that in view of the appeal, the proposed hearing by the District Court on the amount of damages to be awarded under the default judgment is not expected to begin before March," they said.

"Whether the hearing will proceed at the present time will depend on the final outcome of the appeal."

"As previously reported the company denies the jurisdiction of the U.S. court."

Report on Roxby Downs

Canberra THE AUSTRALIAN in English 24 Jan 80 p 9

[Report by Ross Greenwood]

[Text]

THE true worth of Western Mining Corp's Olympic Dam uranium, copper and gold prospect is only just beginning to surface, with yesterday's quarterly report giving another insight as to its enormity.

The report centred on diamond drill hole RD24, about 16km south of the centre of the search, in the Roxby Downs area of north-east South Australia.

The group reported that the hole was completed at a depth of 1150m after two significant areas of mineralisation were found — "one twice the height of Melbourne's AMP building" as WMC executive director, Mr Hugh Morgan, put it.

The company said the second zone showed "significant mineralisation" although assays are not as yet available.

But Mr Morgan described it as being "bloody fantastic."

The assays from the first intersection — already released — gave some insight as to the richness of the hole, with 1 per cent copper and 0.35 lbs per tonne of U₃O₈ (uranium oxide) being encountered in the 306m intersection between 343m and 649m.

WMC also reported that another area had been discovered, about 25km south-west of Olympic Dam, showing similar mineralisation.

This discovery, named the Acropolis prospect, is in an area known as Stuart Shelf and the diamond drill hole ACD 1 was the first to be drilled.

The drill hole was completed at 1098m with one area of mineralisation encountered between 924m and 990m, or an interval of 66m.

WMC has a 51 per cent interest in the Olympic Dam and Stuart Shelf areas with BP holding an option over the remainder.

While Stuart Shelf has younger sediments covering the actual ore-bearing structures, the group recovered an assay of 0.7 per cent copper, almost as strong as at the centre of Olympic Dam, and a lower content of uranium at 0.07lb a tonne.

ACROPOLIS

But the group feels confident about this area and yesterday indicated that further drilling would be carried out.

The find at the Acropolis prospect is the first time that ore has been found off the main ore-stream of Olympic Dam and is significant in that the group now has another prospect to map out and evaluate.

The cost of exploring and bringing the Olympic Dam prospect to the mining stage is believed to be about \$1 billion.

WMC's partner BP has an option to take up 49 per cent of the area, provided it spends

\$10 million in exploration in the next three years. After this to maintain its 49 per cent interest. BP may select up to 10 separate areas and spend \$10 million in each area. WMC will retain the remaining areas.

But initially BP will also provide \$50 million in the Roxby Downs area to meet the estimated cost of exploration, metallurgical testing and other work necessary to complete the feasibility study.

During the latest quarter a permanent camp was established and the eight diamond drills were operating.

The company also encountered further mineralisation 200m north-east of RD17, and drilling is in progress at a depth of 1001m. Mineralisation was intersected from 379m to 453m and 770m to 1000m, but assays are not yet available.

Another hole, 800m east of RD29, was drilled to 680m but no mineralisation was encountered.

Ranger Project Developments

Sydney THE SYDNEY MORNING HERALD in English 24 Jan 80 p 13

[Text]

MELBOURNE. — EZ Industries has decided to join the Peko-Wallsend scheme to develop the \$320 million Ranger uranium project.

EZ directors ended a month of silence yesterday by announcing that they intended to join Peko to form the Energy Resources of Australia proposal.

The announcement follows an EZ board meeting on Monday to discuss the ERA proposal, and comes after lengthy discussions between Peko and EZ.

And it clears the way for the biggest public float in Australian corporate history.

The ERA scheme involves Peko and EZ each holding about 30 per cent of ERA, with 25 per cent of the proposed company owned by overseas power utilities and about 15 per cent held by the Australian public.

Ranger output will be sold to the overseas shareholders.

The size of the public float is tipped at about \$60 million.

EZ's decision to join ERA also means Ranger will be wholly controlled by ERA.

Peko is understood to have been working on a prospectus for the float since the start of

this month, with the issue expected to come on to the market in March or April.

Yesterday's announcement followed the Federal Government's decision last month to sell its 50 per cent Ranger stake, expropriated by the Government in 1974, to the Peko consortium.

Under the sale conditions, Peko had to refund the Government share of expenditures already made, estimated at about \$17 million, and take up the future spending commitment of about \$20 million.

It also paid a premium of \$125 million.

The total costs associated with Ranger are believed to be close to \$320 million.

EZ directors could not resist a last dig at the Federal Government in yesterday's statement.

The directors said they had discussed possible participation in the ERA proposal which had been accepted by the Government.

"While EZ's view of the Government's decision to divest its interest in the project at a profit has been clearly stated, in the circumstances and in view of the Government's decision, EZ has decided to join with Peko in the formation of Energy Resources of Australia," they said.

GOVERNMENT DENIES REPORT ON URANIUM MINE DISASTER

Canberra THE WEEKEND AUSTRALIAN in English 12-13 Jan 80 p 1

[Text]

CLAIMS by a scientist that a uranium mine disaster had desolated large areas of the Northern Territory in the 1950s are untrue, the Minister for National Development and Energy, Senator Carrick, said on Friday.

But he conceded there had been water pollution in the Rum Jungle area as a result of outdated mining techniques.

He ruled out the possibility that a similar problem could recur in present uranium and other mining ventures.

Professor Charles Kerr, head of the preventive and social medicine department at Sydney University, has claimed the effects of an escape of radioactivity in 1950 are still being felt.

He told a Canadian royal commission into uranium mining, sitting in Victoria, British Columbia, that radioactivity could be traced today in an area of the Northern Territory larger than some European countries.

Professor Kerr, who is noted for his anti-nuclear stance, said the contaminated area near the Rum

Jungle uranium and copper mine on the Finnis River, south of Darwin, would remain affected for several centuries and it was possible that future communities established in the remote region would experience above-average cancer rates.

The contamination is alleged to have occurred when heavy rainfall breached an earth wall of the mine's tailings dam, and subsequent flooding washed huge quantities of the dangerous waste from the mine, which supplied uranium to be processed into weapons-grade fuel in America and Britain in the mid-1950s.

Professor Kerr — one of the three members of the Ranger uranium inquiry — told the royal commission that the breach at Rum Jungle had led to Australia's becoming extremely cautious about uranium mining.

Senator Carrick said that rigid environment-protection measures had been developed since the 1950s.

These had resulted in significant reforms to all mining procedures.

"Rum Jungle was not closed as the result of an accident but operations ceased because the mining venture had been completed," Senator Carrick said.

"Essentially the water pollution was caused by copper, zinc and manganese, which were the by-products of outdated mining procedures."

Senator Carrick said he understood Professor Kerr had presented no new material on the Rum Jungle mining experience — which had been fully described by the Fox royal commission.

The commission's second report, the Ranger uranium environmental inquiry, says the Rum Jungle operation was not controlled by the environmental constraints which would apply at the Ranger mine.

CANDIDATE ACTU LEADER PLEDGES STRONG ANTI-URANIUM POLICY

Melbourne THE AGE in English 9 Jan 80 p 3

[Report from Michael Gordon]

[Text] The man who appears certain to be the next ACTU president yesterday pledged to take a stronger line implementing union policy against uranium.

Mr. Cliff Dolan said he would take a tougher stand on the policy "than ACTU officers have done up to date".

Mr. Dolan, 60, seems assured of being elected unopposed as ACTU president when Mr. Hawke steps down to prepare for Federal Parliament in May or June.

He announced his intention to succeed Mr. Hawke at a Press conference in his Sydney office yesterday.

Mr. Dolan's only rival, the ACTU secretary, Mr. Peter Nolan, is expected to drop out of the race rather than face defeat in a postal ballot.

Yesterday the West Australian Trades and Labor Council secretary, Mr. Peter Cook, said he would not be a candidate.

Last night Mr. Hawke gave strong support to Mr. Dolan, who is senior vice-president of the ACTU and federal secretary of the Electrical Trades Union.

"I think he would do the job excellently, but I don't want to be, or to appear to be, the successor determiner — the trade union movement has to be that," Mr. Hawke said.

Mr. Hawke is believed to have urged Mr. Dolan to contest the presidency in several private discussions since he announced his decision to enter Parliament last September.

At the Press conference, Mr. Dolan said he believed that he had the experience and ability to do the job well.

He warned that Australia faced an extremely difficult period over the next five years.

Top priorities for the ACTU would be the maintenance "at least" of real wage standards and the protection of jobs from "the headlong rush in to new technology".

AALC SCIENTIST DEVELOP NUCLEAR TECHNIQUE FOR CRIME DETECTION

Perth THE WEST AUSTRALIAN in English 18 Dec 79 p 38

[Text] Sydney: Australia has won world recognition as a pioneering country in the successful application of an advanced nuclear technique in crime detection--neutron activation analysis, the chemical "fingerprint" of a specimen.

The technique was developed by scientists at the Australian Atomic Energy Commission working in conjunction with forensic experts of the federal police. It has provided a vital breakthrough in a number of major crimes and been accepted in Australian courts.

It is outlined in the current issue of Nuclear News, the monthly publication of the commission.

Neutron activation analysis (NAA) is a method of measuring the quantity, down to a billionth of a gram, of each of a range of elements which occur in an unknown specimen.

SOIL

Australian scientists and police forensic experts have been developing the process for nearly 20 years and the police now apply it to cases involving clues such as specimens of soil.

Known as the "fingerprint" of a specimen, NAA has so far revealed that no two samples of soil have been the same and it is not expected that such a coincidence will ever occur.

Because of NAA evidence in both the detection and ultimate prosecution is now being examined in more scientific detail than ever before.

However, scientists point out that while NAA has a great advantage over other recognised methods because of its ability to measure trace quantities of an element, it has a definite disadvantage—contamination of specimens can easily make the results of examinations useless.

HAIR

Scientists say that of the 100 or more forensic specimens analysed by the NAA method in Australia, over half have provided important court evidence.

"Some have proved unsuitable for neutron activation analysis due to contamination, others have shown to be irrelevant to a case," Nuclear News said.

"Often NAA gives some positive conclusions, but there is not enough evidence to make a worthwhile court presentation."

NAA gave investigators their major break-

through in connection with the murder of a six-year-old Sydney girl in 1973.

The girl had regularly visited the nearby home of a woman and her son in his 40s to see their horse.

On her last visit, the girl was confronted by the man. His mother had died and he had disposed of the horse.

Later, when the girl could not be found the man consistently denied to the police that he had had any recent association with the girl.

STABBED

Her body was found next day under a pile of grass clippings with a stab wound in the chest.

NAA proved that a hair found by the police on the man's trousers had the same trace elements in the same quantities as some hairs taken from the dead girl's head.

This evidence immediately cast doubt on the man's testimony and together with other evidence placed before a court convicted him of murder.

AUSTRALIA

DECLASSIFIED PAPERS SHOW EARLY SUPPORT FOR NUCLEAR POWER

Sydney THE SYDNEY MORNING HERALD in English 4 Jan 80 p 3

[Text] Canberra.--The Chifley Labor Government took preliminary steps in 1949 to investigate the possibility of developing atomic reactors as sources of power for industry.

Cabinet documents, which have been kept secret for the past 30 years, show the interest of the Chifley administration in the new technology.

They also show that there was general agreement among British Commonwealth Prime Ministers, but not shared wholeheartedly by the United States, on the need for a system of international controls on atomic energy.

Apparently the US was wary about sharing its discoveries with other countries.

The documents were released for the first time on Wednesday, but still exclude a number of restricted documents, including the minutes, papers and decisions of the first Menzies Cabinet after the defeat of the Chifley Government in December, 1949.

A spokesman for the Australian Archives, which stores most Government documents of this sort, said yesterday that the Menzies Cabinet documents of 1949 probably would not be released until January 2 next year, together with Government documents for 1950.

The available 1949 documents show that Mr Chifley's Defence Minister, Mr J. J. Dedman, put a strong case to Cabinet for the development of nuclear reactors in Australia.

"The provision of adequate and increasing resources in Australia is of great industrial and strategic importance," he said in a Cabinet minute.

"In comparison with the UK and the US, our potential resources are limited, particularly in certain parts of Australia.

"There is, therefore, much to be gained from the possible development of atomic reactors as sources of industrial power."

Mr Dedman said intensive research and development would be needed and that if Australia was to take part in the early use of the technology, its scientists and engineers should be allowed to take part in developments.

During the same period an inter-departmental committee recommended to Cabinet that there should be exploration of Australian uranium deposits and research into methods for large-scale extraction of uranium ore.

A report to Cabinet by Mr Chifley in June, 1946, in part: "The only solution to the problem of atomic energy is from a system of international control.

"The main point at issue is the stigma of release by the US of scientific knowledge and manufacturing information.

"Possibly nothing has done more to make Russia suspicious and non-co-operative than her exclusion from the agreement made between the UK and the US in relation to this discovery."

Mr Chifley pointed out that scientists argued that there should be no monopoly of scientific knowledge, that the main purpose of the discovery should be for human welfare not for destruction, and that withholding of information would spark rivalry which could put other nations ahead in the technology.

AUSTRALIA

BRIEFS

NABARLEK ORE--Queensland Mines, Ltd, operator of the Nabarlek uranium deposit spent \$22.45 million during the December quarter, directors advised yesterday. The mining of the Nabarlek ore body was completed and fabrication and erection of plant continued. [Text] [Sydney THE SYDNEY MORNING HERALD in English 17 Jan 80 p 13]

GERALDTON RADIATION CHECK--Geraldton: At least 50 sites in Geraldton will be checked for possible radiation exposure from mineral sands tailings used as filling. Officers from the Department of Health and Medical Services yesterday used an ionisation chamber and geiger counters to check radiation levels. They set up the ionisation chamber on part of the ground of the St Francis Xavier primary school, where a lot of mineral sands tailings were used for filling. The team is led by a physicist, Dr Bruce Hartley. There have been 18 requests to the Geraldton Town Council's health department for areas of tailings to be checked. Dr Hartley said that people who were aware that tailings had been spread on their blocks, even as top-dressing for lawns, and who wanted possible radiation levels checked, should get in touch with the council's health department. [Excerpts] [Perth THE WEST AUSTRALIAN in English 9 Jan 80 p 12]

YOUNG LIBERALS' POLICY--A move to prevent nuclear power stations in Australia yesterday split the national convention of the Young Liberal Movement. A Victorian motion calling for the Federal Government to ban nuclear power stations was narrowly defeated after the most bitter debate of the convention. The nuclear debate split the New South Wales delegation and branch president, Mr. David Minty, was strongly attacked by his own members for supporting the motion. The motion, which was strongly opposed by Western Australia, was lost 29 to 32 after Victoria failed to muster its full delegation. A NSW delegate, Mr. Michael Photios, said any move to ban nuclear stations would be "illogical and inconsistent" with the movement's existing policy to support uranium exports. [Excerpts] [Melbourne THE AGE in English 18 Jan 80 p 3]

MISPLACED RADIOACTIVE WASTE--Canberra.--Authorities have lost track of an unknown amount of low-level radioactive material which was accidentally dumped at the wrong rubbish tip this week. The mistake was aggravated when Federal police buried the material immediately it was discovered. Officials had to dig the radioactive phials up the next day, to check that they were all there.

They weren't. "There are some which have not been recovered," a spokesman for the ACT Health Commission said yesterday. They are either still buried at the Kambah tip, which has been further bulldozed, or they have been taken away, the official said. The chain of errors began when a temporary driver, who had not been briefed on the correct disposal of the materials, took the phials from the Woden Valley Hospital. Instead of burying them under Government supervision at the Long Gully tip, the driver dumped them at the Kambah tip. [Text] [Melbourne THE AGE in English 22 Dec 79 p 5]

NUCLEAR-FREE COUNCIL ZONE--A Sydney municipal council, whose area included the main container terminal used for the export of uranium has declared itself a nuclear-free zone. The inner-city council of Leichhardt has called on its officers to erect barricades to prevent the transportation of uranium yellowcake through the streets of the municipality. But it is unlikely the council has the power to put its resolution into effect. The Leichhardt Council resolution called on the NSW Government for support if the council did not have the power to close its streets to the shipments. A spokesman for the Deputy Premier [of New South Wales] and Minister for Trade and Resources said a number of councils in Melbourne had already declared themselves nuclear-free zones. But the spokesman said they had no legal power to block the transportation or export of uranium, because they were federal matters. [Excerpts] [Canberra THE AUSTRALIAN in English 20 Dec 80 p 1]

URANIUM ENRICHMENT PLANT--The Uranium Advisory Council, in a report to Federal Parliament, has given the government a qualified go-ahead to establish a uranium enrichment plant in Australia. The council said it sees no reason why a feasibility study should not be started. It said the government should participate in the establishment of a commercial uranium enrichment industry. The report said the Australian Atomic Energy Commission has the skills and experience to operate an enrichment plant and normal operations of the plant would have little or no effect on the environment. [Text] [OW051415 Melbourne Overseas Service in English 1230 GMT 5 Mar 80 OW]

CSO: 5100

INDIA

BRIEFS

REACTOR LEAK AT TARAPORE--New Delhi, 1 Mar (AFP)--One of the two nuclear power reactors at Tarapore near Bombay suffered recently a mishap that could have resulted in a major nuclear disaster, according to PTI news agency. PTI, quoting informed sources here, said Tarapore escaped the disaster as the unit-one of the plant was fortunately not running when its primary coolant pipe started leaking a few days ago. If the pipe had leaked when the reactor was running, "a core meltdown would be a distinct possibility which would have made the Three-Mile Island (Harrisburg) accident in the United States a minor affair," in comparison, a report said. The Department of Atomic Energy (DAE) which had hushed up the incident for over a week, today confirmed the leaks in the coolant pipe. The DAE, however, described the leaks as "insignificant." The primary coolant pipe carries thousands of gallons of water circulating through the hot and highly radioactive core of the nuclear reactor. Leaks in the pipe during the reactor operation would have flooded the power plant with dangerously contaminated water. [Excerpt] [BK020118 Hong Kong AFP in English 1655 GMT 1 Mar 80 BK]

CSO: 5100

ENERGY OFFICIAL ON CONSIDERATION OF NEW NUCLEAR POWER PLANT

HK191403 Jakarta ANTARA in English 0715 GMT 19 Feb 80 HK

[Excerpt] Jakarta, 18 Feb (ANTARA)--The director general of BATAN (Indonesia's national atomic energy agency), Prof Baiquni, said it would be good for Indonesia to make a decision this year or next year at the latest to have a nuclear power plant set up in 1989. He told a press meeting here Monday that Indonesians would not be opposed to its construction provided they were given the plants advantages and disadvantages.

Indonesia can man the plant and the fuel for the nuclear power plant, which should best have a capacity of 600 mw, could be imported. A heavy water nuclear reactor plant using natural nuclear material is most suitable for Indonesia, he said.

A feasibility study on the project was carried out in 1978. The project is based on a cooperation agreement between BATAN and NIRA (Italy). Results of the study will be extended to the authorities for a final decision. Prof. Baiquni said objections to the construction of a nuclear power plant were mostly political. Men are usually afraid of the effects of such a plant on health and man's offspring.

CSO: 5100

JAPAN

DEFENSE CHIEF: NONNUCLEAR POLICY WILL BE FOLLOWED

OW220749 Tokyo KYODO in English 0703 GMT 22 Feb 80 OW

[Text] Tokyo Feb 22 KYODO--Kichizo Hosoda, director general of the Defense Agency, said Friday he had no intention of neglecting Japan's "three no's" nuclear policy of neither producing, nor harboring nor using nuclear weapons. Hosoda was speaking at a news conference, explaining his remarks in the Diet Thursday that he saw it necessary to study how to counter a growing Soviet nuclear threat.

"What it really meant was we must consider various means to cope with the changing situation. I didn't mean to change the nonnuclear principles or discuss the matter with the U.S. immediately," he said. Opposition parties had criticized that Hosoda's statement in the Diet ignored the nonnuclear principles.

CSO: 5100

PLAN ADVANCED TO PROCESS NUCLEAR FUEL FOR OTHER COUNTRIES

OW040315 Tokyo KYODO in English 0246 GMT 4 Mar 80 OW

[Text] Tokyo March 4 KYODO--Japan should positively agree to enrich uranium and reprocess waste nuclear fuel for foreign countries, if requested by them, Hiromi Arisawa, chairman of the Japan Atomic Industrial Forum, Inc. (JAIF) said here Tuesday. He made the statement in a speech at the opening session of the 13th annual convention of the forum.

Observers believe Arisawa made the statement to stress to quarters concerned with nuclear energy the need to make a switch on the (?basic) concept in the development of atomic energy at a time when international calls for prevention of nuclear proliferation are growing. At present, plans for uranium enrichment and reprocessing of spent nuclear fuels are being studied merely from the standpoint of meeting the needs of nuclear power plants in the nation.

Plants for uranium enrichment and spent nuclear fuel reprocessing in the country are not expected to go into full-scale operation on a commercial basis until sometime after a decade from now. The observers believe that Arisawa, in making the statement, bore in mind neighboring countries, such as South Korea and Taiwan which already have N-power plants, and the Philippines and other countries in the Asia-Pacific area which are now constructing such plants.

Arisawa emphasized the responsibility of advanced countries in the nuclear energy field by saying that Japan's positive cooperation in international nuclear energy development efforts will lead to helping prevent nuclear proliferation. He noted that the second energy crisis is expected to become more and more serious and said N-power is the only alternative energy source that can be utilized immediately.

He said Japan has been engaged from the beginning in development of atomic energy aimed at establishing a nuclear fuel cycle and much results were attained last year when a pilot plant for enriching uranium started operating at Ningyotoge in Okayama Prefecture and operation of a test fuel reprocessing plant was resumed at Tokaimura, Ibaraki Prefecture. Arisawa said it was meaningful that studies by the International Nuclear Fuel Cycle Evaluation (INFCE) have resulted in deepening understanding on promoting peaceful utilization of nuclear energy and in confirming the fact that effective ways for preventing nuclear proliferation are possible without harming development.

Arisawa's statement was believed to be in line with the conclusion drawn up by the INFCE at its final plenary session in Vienna late last month. The general tone of the report issued after the conclusion of the meeting was that engaging in multinational undertakings on uranium enrichment and reprocessing of spent fuels is much better from the standpoint of preventing nuclear proliferation than having a single country engage in such undertakings.

Arisawa's statement, thus, is believed to counter the view mounting among quarters concerned in Japan after the INFCE meeting that the advocacy of Japan and West Germany for independent enrichment of uranium and reprocessing of spent nuclear fuel has been recognized.

CSO: 5100

FUKUSHIMA NUCLEAR REACTOR PROBLEM ASCERTAINED

OWO40023 Tokyo KYODO in English 0008 GMT 4 Mar 80 OW

[Text] Tokyo March 4 KYODO--A small steel pipe used for scaffolding which maintenance workers forgot to remove after a regular checkup in 1978 caused damage to the steam turbine of a nuclear reactor of the Fukushima plant of Tokyo Electric Power Company in 1978, [as received] it was learned Monday night. The Natural Resources and Energy Agency warned Tokyo Electric Power Company to take measures immediately to prevent similar accidents from occurring after the flaw was discovered Monday.

Agency officials said three of the 16 blades of the high pressure steam turbine of the No. 3 reactor of the plant were found scratched in the latest regular checkup being conducted since late last October. They said workers found a steel pipe five centimeters in diameter and eight centimeters long lodged between the blades. Four fragments of the pipe also were discovered lying at the bottom of the turbine container.

Officials of Tokyo Electric Power Company said the pipe was one of those used for scaffolding. They believed the pipe in question was accidentally left behind in the reactor after the previous regular checkup was completed in December 1978.

Although the reactor resumed commercial operation later, no major accident occurred because the pipe was small, officials said. Officials said covers are attached to all openings of the turbine at times when checkups are conducted. They believe the steel pipe fell into the turbine because workers who conducted the checkup in 1978 failed to cover the openings, they said. The officials said the damaged blades can be repaired through welding in 10 days.

CSO: 5100

PAKISTAN

HAQ ADVOCATES SUPERPOWER SECURITY GUARANTEE

DW941122 Frankfurt FRANKFURTER RUNDSCHAU in German 29 Feb 80 pp 10-11 DW

[Interview with Mohammad Ziaul Haq, president of Pakistan, with Karl Grobe in Rawalpindi, date not given]

[Excerpt]

FR: Well, there is the old quarrel over the nuclear development. Your country has suggested the mutual inspection of the nuclear research installations and nuclear power stations. Has India reacted to this suggestion in the meantime?

Zia: No, not to date. I also reminded Mrs Gandhi of that, and also wrote to former Prime Minister Morarji Desai about it. I proposed the inspection. If India believes that we are developing an atom bomb, and if we admit that India is farther advanced, then India should not worry about Pakistan--our nuclear energy exclusively serves peaceful purposes. If India does not believe us we should have inspections, our installations are open to them if we, too, are allowed to inspect theirs.

FR: A former president--he is no longer alive--indeed spoke of atom bombs....

Zia: As far as I know he did not. Do you mean Ayub?

FR: No, Bhutto....

Zia: Oh yes, he said: The Jews have a bomb, the Western world has a bomb, the Eastern world has a bomb, the Hindus have a bomb, only the Muslims do not have a bomb. He said that in a negative sense, but this implies something. For your information: Bhutto was a very able man, very intelligent, but very impulsive. But he certainly did not mean that literally. He spoke as a politician who wanted to show the world how strong he was, but he failed to take into consideration that Pakistan cannot bull its way through. I think that this statement by Bhutto can only be termed irresponsible.

FR: Hence, no political statement but a rhetorical figure of speech?

Zia: Let us make it clear: We do not develop any bomb, we are not for nuclear weapons, the history of my government--the past 2 years--is an open book.

We have suggested that the Indian Ocean, the entire region, be declared a denuclearized zone, and we have stated that the havenots must be granted guarantees by the countries having nuclear weapons. After all, this whole thing is a policy of peaceful utilization.

PR: But the superpowers now also have submarines carrying nuclear weapons cruising in the Indian Ocean and bring nuclear weapons to the region after all. Can you imagine a strategy which would keep the superpowers away from this part of the world?

Zia: I would very much like to try it on two levels: One is the level of the nonaligned countries, the other is the level of the Islamic countries, for most of them are located in this region, the so called crescent of crisis. But if another country makes a start, we surely would follow it on this course.

CSO: 5100

'DER SPIEGEL' ON STATUS OF PAKISTAN BOMB

Hamburg DER SPIEGEL in German No 46, 12 Nov 79 pp 202-209

[Article: "Atom Bombs For Islam?"]

[Text] Pakistan Procured the Know-How for the Construction of the Bomb from the West

A Pakistani atom spy in Holland, secret consignors who place orders for parts for a uranium enrichment plant in Europe, a secret nuclear plant in Kahuta: Pakistan attempts to build an atomic bomb. India is already threatening countermeasures. A nuclear arms race on the subcontinent can hardly be stopped.

"We are going to build an atomic bomb, even if we have to eat grass," Pakistan's former chief of state Ali Sulfikar Bhutto once said--only a few hours after Pakistan's deadly enemy India had exploded its first atomic bomb on May 18, 1974.

Four years later Bhutto's rule had come to an end. First overthrown for election fraud and corruption, then indicted for incitement to murder and executed in April 1979, the ex-premier still succeeded in smuggling out of his death cell in Rawalpindi a 319-page statement of justification. It contains what is thus far the most reliable indication of the status of the Pakistani nuclear project.

Said Bhutto in his testament: "We were already on the threshold of full nuclear potential when I left the government to enter the death cell." That was the situation at the end of 1978.

Today the threshold has long since been crossed. The CIA, the American intelligence service, fears that Pakistan could set off its first nuclear weapon any time now and thereby enter the nuclear power club--a thought which shocks the classic nuclear powers, the United States and the Soviet Union, to an equal degree.

The Pakistanis succeeded in their coup by deceiving the industrial nations for years on end as to their real intentions. The full scope of what could turn out to be one of the greatest espionage scandals of our century is only now becoming clear.

Pakistan [appears to have] acted in accordance with a well-contrived plan. In 1975 Bhutto ordered a reconversion plant for nuclear fuel from France. His calculation in so doing: since Pakistan was not a party to the non-proliferation treaty, which prescribes stringent international supervision of the nuclear technology sector, the nuclear powers would focus all of their attention on the French-Pakistani deal.

Many intelligence agencies did, in fact, come to the conclusion that Pakistan could, with the help of this plant, succeed in acquiring plutonium--the basic material for the building of an atom bomb. For this reason the nuclear powers demanded far-reaching guarantees against a possible misuse of the French plant.

While the international nuclear authorities as well as the United States and France were negotiating further with the Pakistanis about the fine points of the control stipulations for the French reconversion plant, Bhutto put into effect Stage Two of his secret plan: the construction of a uranium enrichment plant without foreign assistance.

The enrichment of uranium isotope 235, which in nature amounts to only up to about 0.7 percent of the uranium, is technologically the most costly and most difficult part of the building of an atom bomb. The building of the bomb is itself relatively simple when the size of the device is not a factor--as, for instance, for demonstrational purposes.

Pakistan had in the meantime obtained the technology for uranium separation using secret channels from exactly those countries with which it had been negotiating for increased cooperation in the nuclear sector.

The head of the Pakistani nuclear espionage [effort] was Dr Abdul Quader Khan, a Pakistani physicist, who spied successfully for years in the European nuclear industry. Khan had begun in 1972 in a laboratory of the Dutch industrial giant Verenigde Metaalfabrieken Werkspoor, which was concentrating especially on metal alloys in the field of reactor technology.

In order to avoid embarrassing questions, he professed to want to become a Dutch citizen. On the questionnaire he listed his South African wife as a Dutch national. His attempt succeeded, and Khan obtained a certificate of nonobjection.

Two years later the Pakistani research scientist succeeded in his attempt to get into the plant which most interested him--the uranium centrifuge

in Almelo. In the top secret nuclear plant, which is to be operated jointly by the Federal Republic of Germany, Great Britain and the Netherlands, ultracentrifuges produce uranium fuel for the whole world, [through a process which] enriches the U 235 reactor fuel by flinging out the heavy isotope 238.

Bhutto's man in Almelo was especially interested in the construction of the centrifuge and the alloy used in the construction of its rotors. Khan was helped by a stroke of luck. Since he spoke German and Dutch equally well, top secret documents were left with him for translation, among them material relating to the construction of and a list of all of the contractors for the Almelo project.

Seventeen days later the inquisitiveness of the Pakistani in Almelo attracted attention. Khan was asked to leave the nuclear plant. After this, he joined the Comprimo Engineering Office and continued his spying there. This company specialized in high-power centrifuges--the core of a uranium separation plant.

Khan had by then, in fact, attracted the attention of Dutch security officials, but before they could act the Pakistani disappeared late in 1975. He told neighbors he was accepting a new job in Pakistan's Ministry of Economics.

Immediately after his return, Khan became the director of the Pakistani pilot plant for uranium separation and the chief advisor to the Pakistani Government on the purchasing of parts for the construction of a large separation plant in Kahuta, 35 kilometers from Rawalpindi.

Pakistani agents throughout the world at once began buying up specialized instruments for uranium centrifuges. Most of the instruments were in [general] use in large laboratories and thus fell under no kind of international control--equipment like vacuum pumps, high-frequency formers, and special drive units.

Yet the Pakistani Government set about its work with great caution. It set up a "cover" company, the Special Works Organisation, at Kitson Road 169, Westridge, Rawalpindi. It was headed up by Brigadier General Amir Ali Said, an engineer trained in the United States, who had [direct] access to Prime Minister Zia ul-Hak, to whom the entire project had been subordinated.

In the past 2 years the Pakistanis bought material for the gas centrifuge valued at over 40 million [German] marks. A large share of their orders were handled through a cover address in Bonn. On January 11, 1977, Ikram-ul Haque Khan, a Pakistani directly responsible to General Said, was set up in Bonn-Wachtberg, a small town about 20 kilometers from the German capital in an apartment in Hauptstrasse 8c.

From Bonn, embassy counselor Khan, holder of a Pakistani diplomatic passport, steered orders for equipment for the planned uranium enrichment facility to firms throughout Europe. The initial order for 31 "converters and interrupted [unterbrochene] power generating plants" worth 133,566 pounds was sent to the British firm Emerson Electric Industrial Controls, based in Swindon. Among Emerson's other customers is British Nuclear Fuels Ltd., which had ordered similar equipment for use at the British Capenhurst uranium enrichment plant.

The Emerson firm was instructed to deliver the equipment to one Schimitar Engineering Ltd. in Swansea. Before it arrived, however, Schimitar abruptly pulled out of the deal and was replaced by Weargate Ltd. The Weargate firm is, in turn, 66 percent owned by Abdus Salam, an Englishman of Pakistani descent reputed to be in close contact with the Pakistani nuclear authorities.

The initial shipment of 31 converters was sent out in August of last year from Tilbury--in accordance with Emerson invoice Nr 878531 to Ali Said, the general director for special expenditures in Rawalpindi. The second installment of 31 converters was handled through the German firm "Team Industries" in order to impede possible investigations.

Khan had his inquiry to the West German firm Team Industries in Leonberg [near Stuttgart] sent via the Pakistani Embassy in Paris with the request to solicit bids for converters. Emerson in Swindon came forth as a bidder; Khan granted it the order via the Stuttgart firm.

The second shipment was sent by air freight to Rawalpindi by Schenker, a German transport firm and subsidiary of the German State Railways, through its branch office at London's Heathrow airport.

Pakistan also ordered millions of marks worth of equipment and construction components in the Federal Republic. The Singen aluminum rolling mill delivered aluminum rods and hundreds of kilograms of forged small parts made especially to Pakistani specifications. Company spokesman Wannig said: "In the export business one simply has no guarantee against a possible misuse of such parts."

But even if the aluminum parts did not appear suspicious to the company management, other shipments contained still clearer clues as to their possible intended purpose. Such might have been the case with the Pakistani shopping list received by the Laybold Heraeus firm in Hanau, the world's largest company in the field of vacuum technology. For 3 years this firm delivered special equipment like vacuum pumps and gas purifying systems to the Pakistanis. The total volume of the deal was in the order of nearly 6 million German marks. The firm's management explained that it was purely a question of equipment "which may be purchased anywhere."

In dealing with Swiss companies the Pakistani buyers were even clearer as to the intended purpose of the shipment ordered. The representatives of the Special Works Organization first ordered special vacuum parts from the Swiss firm A.G. for Vacuum Equipment Technology (VAT) needed for the intake and exhaust functions in gas centrifuges. But then the Pakistanis wanted more; they indicated to the Swiss firm that they would be interested in receiving assistance with the planning and construction of a special plant for the treatment of gaseous uranium [Urangas] before and after the actual separation process.

VAT was ready to take on the project, but first they applied for the permission of the Swiss authorities. Although there was no doubt about the uses of the equipment being ordered, permission was given in writing on August 12, 1977. The justification: the export of the components is in violation of neither the provisions of the Non-Proliferation Treaty nor the guidelines of the London Club.

Pakistan thus advanced a step further toward [the construction of] a bomb. The large plant was built in the record time of only 8 months at Cora Engineering in Chur and, after extensive helium density tests, was flown to Pakistan in June 1978 in three American large-capacity transports.

The centrifuge project first showed signs of faltering when Bhutto, the Pakistani head of government, encountered public criticism because of complications arising from unauthorized special payments and the multi-million mark purchases in Europe.

When Bhutto was overthrown, many Pakistanis believed that this would also be the end of [the country's] nuclear armament. This view gained credence from Bhutto's assertion from his death cell that his successor Zia-ul Hak had overthrown him in order to torpedo his nuclear plans.

General Zia, however, was by no means considering giving up the ambitious dream of making his country into a great power. Quite the contrary.

In the first place, Zia sent his nephew Abdul Waheed, to Bonn as ambassador, and from Bonn Waheed acted as disbursing officer for the nuclear project. Then the prime minister appointed Tariq Mustafa, a high officer involved in armament production as head of Pakistan's nuclear energy board. Zia's instructions to his fellow officer: To tighten security precautions and to handle the auditing of the accounts. Since Mustafa's appointment, top officials of the nuclear procurement program are authorized to make expenditures of up to a million dollars without auditing.

Until the end of 1978 the security system [designed to] camouflage the bomb plans functioned so well that no one uncovered the secret dealings of the Pakistanis. It was luck that first put the Europeans on the track of Pakistan's nuclear armament.

Libyan Money for the Pakistani Bomb

In September 1978 Emerson, the company in Swindon, received its third order from Pakistan, [this time] for 100 "Accuspeed As-1604 HF-Converter(s?)" and spare parts worth 5 million marks. Delivery, which was again to be handled by Weargate, was planned for December 4th of last year.

In September, however, Emerson was still on strike, and a worker told Frank Allaun, chairman of the Labour Party's parliamentary delegation, about the odd transactions which all bore the notation "Pakistan Special Project." Allaun, who learned that the same equipment was being used in the British uranium enrichment plant at Capenhurst, at once alerted Anthony Benn, who was then Minister of Energy. Benn immediately imposed export controls on the delivery of electrical high-frequency converters. In the meantime, however, the 61 converters of the two initial shipments had long since reached their destination. Nuclear experts estimate that they will be sufficient to supply a few thousand centrifuges with energy and to produce enough uranium for an atom bomb.

The Federal Republic, the United States and the Netherlands were alarmed by the Emerson order. On July 4 of this year, the Federal Ministry for Economic Affairs placed the export of converters of the Emerson type on the list of goods requiring approval. The Netherlands set up a special commission to probe the extent of Khan's nuclear espionage.

Even more alarming to the Western countries is the possibility that Libya's Qadhdhafi is behind the Pakistanis, and is in this way seeking to obtain the atomic weapon.

Already in 1975, Qadhdhafi is said to have tried to build an Arab bomb with the assistance of Arab scientists. Since he was unable to bring together enough nuclear specialists, however, he gave up his plans. Later, according to intelligence circles, he turned to Pakistan, offering money to his Islamic coreligionists for the building of an "Islamic bomb."

Whatever truth may be in these rumors, it is known that Qadhdhafi offered the Pakistanis 40 million dollars and in October of last year sent Major Ahmed Jalloud, a close confidant, to Rawalpindi. Western diplomats in the Pakistani capital claim that he inspected the status of the bomb.

For the CIA that was only one of many signs that Pakistan was possibly on the verge of a breakthrough. Already in March the CIA found the status of the Pakistan's nuclear weapons development so menacing that it informed the White House.

The Americans then cut their economic aid from 120 million dollars to 40 million and are said even to have considered occupying the uranium project in Kahuta with a commando unit. Nothing thus far, however, suggests

that Pakistan would for that reason abandon its nuclear plans. Quite the contrary!

"Has the United States gone mad?" asked the influential Rawalpindi paper NAWA-I-WAKT, and Defense Minister Ali Ahmed Talpur projected resolution even in the face of the superpower America. Said Talpur, "Pakistan will yield to no foreign pressure in its nuclear program."

Even the meeting in late October between Pakistan Foreign Minister Agha Shahi and Vance, his American counterpart, at which the United States brought pressure to bear [on the Pakistanis] brought no rapprochement--on the contrary.

Hardly had Shahi returned from Washington when his president again expressed [his] intransigence. His country actually has no desire to build any atom bombs, said General Zia cryptically, but a nuclear explosion might at any time become necessary, if the situation so requires.

In order to emphasize his determination, President Zia several weeks ago had the nuclear centers around Rawalpindi and the uranium enrichment plant in Kahuta, as well as the research laboratory in Islamabad, placed under the protection of Crotales anti-aircraft missiles. In addition, jet aircraft continually circle above the endangered installations, since the Pakistanis fear that the Indians, above all, would use all means to prevent Pakistan from becoming a nuclear power.

It is probably already too late for that. According to the latest intelligence reports the Pakistanis are building an underground test site for the nuclear explosion in the Sind desert. Western nuclear exports doubt that a nuclear arms race between Pakistan and India can any longer be stopped.

CSO: 8120/7458

PEOPLE'S REPUBLIC OF CHINA

BRIEFS

REPORT OF PRC NUCLEAR BASE--Delhi, March 4, TASS--China is building a big missiles base, where nuclear weapons will be deployed, at Nagcchu, 300 kilometres north of Lhasa, the capital of Tibet, the TIMES OF INDIA reports. Seventy medium-range CSS-1 missiles and 20 CSS-2 intercontinental missiles are already at Nagcchu. [Text] [LD040944 Moscow TASS in English 0835 GMT 4 Mar 80 LD]

CSO: 5100

OFFICIAL SAYS SURVEYS REVEAL POSSIBLE URANIUM DEPOSITS

BK041351 Colombo CEYLON DAILY NEWS in English 13 Feb 80 p 5 BK

[Article by Winston de Valliere]

[Excerpts] Preliminary surveys carried out late last year on an islandwide basis had revealed the possibility of uranium deposits in Rakwana, Ratnapura, Embilipitiya, Wilpattu and the Maha Oya area, a spokesman for the Mining and Mineral Development Corporation said yesterday.

Analysis of soil and silt concentrations from stream beds in the areas had revealed a .03 percent concentration of minerals that contain the radioactive uranium, he said. The islandwide surveys were carried out on the basis of one soil extract from every 40 square mile area within an aggregate 500 square mile area of these districts. This would be followed up with more detailed soil tests, he said.

The surveys, initiated by the Geological Department of Ceylon, were conducted with experts from the International Atomic Energy Authority of Vienna, (IAEA), the spokesman said. The surveys were a followup of recommendations submitted by a Viennese expert who assisted in the point explorations.

The state Mining and Mineral Development Corporation would obtain more assistance from IAEA for further explorations, the spokesman said.

The next step would be a detailed sampling program with soil extracts on a smaller scale, possibly on the basis of a sample from every 10 square mile area from the identified 500 square miles.

While the corporation was placing the uranium explorations on a priority footing, the spokesman was emphatic that no false hopes were to be held out to the public. He said that better results from the scaled-down soil sample survey would lead to a thorough subsurface drilling program.

CSO: 5100

POLISH CORRESPONDENT GIVES OUTLOOK ON NUCLEAR POWER IN SOVIET BLOC

Warsaw TRYBUNA LUDU in Polish 18 Feb 80 p 6

[Article by Bogdan Mikolajczyk, Moscow correspondent of TRYBUNA LUDU]

[Text] In the Soviet Union nuclear power already plays a significant role and its position in the overall fuel and energy balance is becoming stronger all the time. This year the total capacity of new plants supplying the national economy with electric power will exceed 14,500 megawatts; more than one-third of it will be coming from nuclear power plants.

What is the outlook for atomic power in the Soviet Union? This topic was discussed by Anatoliy Aleksandrov (president of the USSR Academy of Sciences) and Andryannik Petrosyants (chairman of the State Ad Hoc Committee for Peaceful Uses of Nuclear Energy) with correspondents at conference in Moscow.

Atomic electric power plants contribute now approximately 5 percent to the total production of electric power in the Soviet Union. In absolute figures this corresponds to more or less 11,000 megawatts. In comparison with other countries, this is not much as revealed at economic conferences. In Switzerland nuclear power plants produce one third of all the electric power, in Bulgaria 20 percent, in the United States and in France approximately 12 percent.

How can this be explained? First of all, the Soviet Union has sufficiently large natural fuel resources and a tremendously high hydroelectric power potential so that there is no compelling reason for constructing nuclear electric power plants. Not everywhere, at least. The coming years will bring substantial changes in this situation, dictated by a need to correct the structure of the energy balance on the basis of cost effectiveness. By 1995 the share of nuclear power produced in the Soviet Union will increase to 20-25 percent. In other words, nuclear energy will be harnessed to supply, on the average, every fourth kilowatt hour. This fast growth of nuclear power will take place mainly in the European part of the Soviet Union, in the Urals and in the trans-Caucasian republics. There the demand for electric energy is rising fast. Natural energy sources there are scarce, while transporting fuel from Siberia or Northern Kazakhstan would

raise the cost of energy production and transmitting electric current from elsewhere would increase the power losses.

As to the progress in reactor engineering and technology, it will follow two directions. On the one hand there will be improvements and increases in the unit capacity of conventional operating equipment, as the specialists call it, with free neutrons. On the other hand, there larger and larger breeder reactors will be built. Reactors, that is, which produce more fissionable material than they use in the energy generating process. Such reactors offer a unique kind of self-sufficient power systems.

Such a plant has already been operating for several years in the city Shevchenko on the Caspian Sea, generating electric power and at the same time desalinating water for the city's 120,000 population. This year, according to professor Aleksandrov, the next electric power plant with a 600 megawatt fast-neutron reactor will be put in operation in the Urals. Soviet scientists are working on a still larger breeder reactor, a 1,600 megawatt colossus unequalled in the entire world.

Breeder reactors are expected to become widespread in the Soviet Union during the coming 15 years so that one third of all energy generated in Soviet class A plants will come from such reactors.

A recent important trend in the use of atomic energy is construction of electric power and heat generating plants, which produce not only electric energy but also thermal energy for city heating as well as for industrial and domestic water heating. Large nuclear central heating plants will be installed in Voronezh and Gorkiy by the middle of the next five-year plan period.

News recently appeared in the Soviet press from the Institute of Nuclear Reactor in Dmitrovgrad near Ul'yanovsk, where a small prototype nuclear "boiler plant" has been built. Such a "boiler plant" can serve an agricultural-industrial complex or can provide heat in northern regions and in Siberia with huge savings of crude oil and natural gas.

The outlook for development of nuclear electric power plants in countries of the socialist community is linked to the development of the Soviet nuclear power industry and particularly to the construction of the "Atom-mash" combine, where reactors will be commercially manufactured (investments have already been made to get the first stage of this project started), also to plans for co-producing nuclear power plant equipment in other countries within the CEMA framework.

According to the long-range target-oriented program of cooperation in the field of power generation combined with fuel and raw materials stockpiling, atomic electric power plants with a total capacity of 37,000 megawatts will by 1990 be installed in the European CEMA countries and Cuba. Meanwhile, two electric power plants of this type with a capacity of 4,000

megawatts each will be built within the territory of the Soviet Union to supply electric power to member countries participating in this project. Poland is among them.

Looking ahead, by 1990 the capacity of nuclear electric power plants in all CEMA countries will reach 120,000 megawatts and the energy generated in these plants annually will be equivalent to burning 240 million tons of standard fuel.

2415

CSO: 5100

NUCLEAR ENERGY DEVELOPMENT OUTLINED

Warsaw PRZEGLAD TECHNICZNY INNOWACJE in Polish No 1, 6 Jan 80
pp 28-31

[Excerpts from an article by Marek Rostocki: "On the Don, the Danube, and Other Places"]

[Text] Gyeorgi Dichev, the top man (after God) in the Bulgarian power plant, Kozloduj, talked with the director of Sofia television only once. That was when representatives of his staff came to him after the vague coverage of the Harrisburg breakdown by TV Sofia and asked: "Why don't you, sir, tell it how it really is with nuclear power?" The director then called TV Sofia and asked, not too cordially, why, for example, were the Three Mile Island events covered on Moscow television by Valentin Zorin, the outstanding expert on American affairs, and only after consulting with professor Aleksandrov, president of the USSR Academy of Sciences, while in the Sofia studio this explanation was entrusted to a randomly chosen economist. The outcome was that in similar situations in the future, specialists will be called upon. Several months later, in talking with reporters, director Dichev admitted that his decision was influenced by the 100 infants per 1,000 workers in Kozloduj.

For three weeks, as guests of the NOVOSTI press agency, we searched for a reply to the question why nuclear energy must be developed in CEMA countries. We visited operating power plants, talked to engineers, scientists and government ministers, and climbed scaffolding. Looking at the almost ostentatiously

lush greenery around the buildings housing the reactors, we asked about the storage of radioactive wastes. We looked at the conversion of nuclear fuel through windows several millimeters thick. We argued about whether burning hard coal is harmful and about the capital-intensiveness of energy derived from brown coal. In the evenings we returned to our hotels exasperated by the diverse meaning of modern technology.

Out of the information and the emotions, the following picture of nuclear energy in European socialist countries emerges.

Touching the Atom

We arrive in Moscow and immediately have our first surprise.

On PRAVDA's front page, the USSR Minister of Power and Electrification, Mr. Neporozhniy, talks about beginning the assembly of the first 500 MW magnetohydrodynamic unit in Ryazan. The American dollar falls from 76 to 73 kopecks in one day.

In the modern CEMA building, engineer Andrey Borchenkov, representing the Permanent Commission on Peaceful Uses of Atomic Energy, regards the prospects of the power industry's utilization of magnetohydrodynamic generators with great skepticism: "The extremely complex technology causes many problems." And higher efficiency, fuel conservation, less environmental pollution? Not worth talking about.

The atmosphere becomes livelier when figures are cited from the Polish Statistical Yearbook, showing that in the GDR and Czechoslovakia less electric power was produced in nuclear power plants in 1977 than in 1976. --"This is a temporary situation, resulting from the startup of new reactors. Soviet power plants operate an average of 5,000 hours a year, and the Novovoronezh plant operates 7,000 hours. Only our best power plants, and some American ones, can match this."

There will be more such comparisons during this trip.

Not too long ago the investment cost of one "atomic" kilowatt was 100 rubles. In the Chmel'nitskiy Atomic Power Plant (the first current will flow in 1984) each kilowatt will cost 450 rubles. In the United States 1 kilowatt now costs \$1,000. --"When prices go up, target dates are extended", is Borchenkov's brief reply to the question why fewer power plants are being built than was planned. Despite delays, 100,000 megawatts in the capitalist countries and 11,000 in the socialist countries, including the Soviet Union (as of 1 January 1979) represents a significant portion of the entire electric power industry. Particularly since the number is constantly increasing.

The Soviet five-year plan envisages that nuclear power plant capacity will increase by 13,700 MW at the end of 1980. When compared with 3,800 MW during 1971-1975, this will be a large increase. The relative changes will be less noticeable: In 1975 nuclear power plants in the Soviet Union produced 2.5 percent of all electric power; in 1980 they will produce 4 percent. But in the European part this share will be 10 percent. One of the canons of Soviet energy strategy is construction of nuclear power plants far from coal basins. That is why in Siberia conventional thermal power plants predominate and will continue to do so for a long time.

What about breeder reactors? We know that in Shevchenko on the Caspian Sea there is such a reactor, 350 MW capacity, which is used in sea water desalination. We also know that the Soviet Union is collaborating with France, which is building a 1200 MW breeder reactor. Andrey Borchonkov agrees that this is where the future of nuclear energy lies. But something, perhaps the long experience of a Siberian engineer, perhaps a sense of responsibility for opinions expressed, makes him add, "Not one gram of plutonium has yet been obtained on any breeder reactor in the world".

A question on the Finnish power plant, Lavis, built with the technical assistance of the Soviet union, using VVER-440 (Novovoronezh type) reactors, is asked. Present economic performance figures place it in 16th place on a world list of all active power plants. Previously, for a long time Lavis was listed with the first ten. Furthermore, after the Harrisburg failure, the Finns placed an order with the USSR for a reinforced shield, such as used in Novovoronezh with the VVER-1000. This cost them 25 million rubles.

As to Romania, it participates in CEMA activities in nuclear power development, although it also collaborates with Canada in its planning. Heavy-water Candu type Canadian reactors, for low-enriched uranium, will be installed in Romania. Talks were also conducted on building power plants with Novovoronezh reactors but the Romanians set forth some unrealistic requirements as to their earthquake resistance.

"But it is safe in Novovoronezh?", we joke in saying goodbye to Andrey Borchonkov. "There has never been a failure in Novovoronezh and, God willing, there will be none", with some pride replies the man who was responsible for starting up more than one power plant.

Before leaving Moscow we meet briefly with Vladimir Nevski, director of the all-union association "Atomenergo" (65 percent

nuclear equipment production). He defines the main goals of Soviet nuclear energy: produce 100 GW in the year 2000; progress from VVER-440 pressurized-water reactors to 1000 MW reactors of the same type; obtain the technological know-how to commercially manufacture VVER-1000 reactors, and, in the future, breeder reactors, also 1000 MW capacity; develop alternative technology graphite-moderated channel reactors, used in the Leningrad Atomic Power Plant (the Soviet Union's first 1000 MW unit was started up there in 1973, the second, two years later). Asked about Lavis, he laughed as he replied, "The Finns, aesthetes, built it so that it looks like a toy". When we try to back Nevski against a wall with a question on why the Soviet Union has to develop nuclear energy when it has such enormous reserves of mining fuels, he says, "The Americans also have large coal reserves and despite this they are building nuclear power plants".

At the beginning of the 21st century, nuclear power plants in the socialist countries (not including the Soviet Union) will have a combined capacity of 33 GW.

They Were First

Novovoronezh, a town of 30,000, almost lost in the forests, is 40 km from Voronezh, the large center of Soviet aviation and electronic industry.

In 1964 in Novovoronezh the Soviet Union's first commercial nuclear unit, 210 MW capacity, was started up. Here, in 1971, the first pressurized-water reactor, 440 MW, began operation. After improvements were made, it became the VVER-440, the basis of nuclear power in the socialist countries. Here, also, the first VVER-1000 reactor will soon be started up.

In July 1973 the Shevchenko power plant will begin operation with a breeder reactor. A 600 MW liquid-sodium-cooled breeder reactor is being set up in the Byeloyar power plant.

In 1950 Igor Tamm developed the theoretical bases of thermonuclear fusion, later expanded by Artzymbovich. The first Tokamak reactors were built and nuclear physics entered the modern age.

The modern age is also represented by the Novovoronezh landscape on the Don: four reactors, 1465 MW combined capacity and 10.5 billion kilowatt-hours of electric power produced in 1978. Cost of 1 kilowatt-hour--only 0.6 kopeck. Anatoliy Semyonovich Muravov, director of the nuclear fuel loading department, briefly describes the pressurized-water VVER reactor:

"Primary cycle water, flowing under pressure through the active zone, acts both as a coolant and as a fission reaction moderator. Up to 50,000 cubic meters of water passes through the reactor in one hour. The cylindrical vessel, made of chromium-molybdenum-vanadium steel, measures 3.8 m diameter, 11.2 m high, 12 cm wall thickness. The active zone itself is 3 m diameter, 2.5 m high. The 369 fuel rods (including 71 control rods) are placed in the zirconium shield. Operating time with low-enriched uranium (to 2 percent) is 12,000 MW days per one ton of uranium; with highly enriched uranium (3 to 3.6 percent) operating time increases to 28,000 MW days per ton of uranium."

Most impressive is the construction (now nearing completion) of the fifth unit using a VVER-1000 reactor. A reinforced dome, 76 m high with walls 1.2 m thick, has been the dominating feature of the power plant for several months. We climb to the very top, to the uppermost edge of the reactor cylinder. The assemblers we pass are mostly young workers. Inside the dome everything is overwhelmingly large. Every sound, every reverberation, is multiplied many times. Below will be the primary cycle pumps, heat exchangers and steam generators. There, on the side, will be the pool in which the burned fuel rods will be stored for several months. And here, on top, automatic equipment for exchanging them will be installed. Soon the dome will become silent. The hermetic doors will slam, the pressure will drop, and the ventilators will begin to work. If there should be a failure, such as a radioactive leak or an explosion, the dome will provide safety to the surroundings. While descending from the dome, one of the engineers points to the special shape of its upper portion, explaining that this is designed to weaken any possible shock wave.

And so, necessarily, begins the talk of nuclear power plant safety. Naturally, Anatoliy Semyonovich knows every detail of the events in Harrisburg. Pressurized-water reactors are in operation both here and there. Conclusions? The American reactor had only two cooling cycle pumps (and one failed)--the Novovoronezh reactor has six. Secondly, operational maintenance was seriously neglected at Three Mile Island: for example, boron stalactites were permitted to form near the valves. And finally, examination of the VVER reactor automatic control system showed that an operator error, such as was made in Harrisburg, is extremely unlikely. This does not mean that an examination of causes of failure in the American power plant will not be continued. It will be, as soon as further details are revealed.

What about radioactive wastes? After partial cleaning and solidification, they are placed in underground atomic dumps. Larger amounts are stored by methods that have been tested in an atomic

storage yard near Dimitrovgrad, not far from Ulyanovsk. During 1966-1975, 775,000 cubic meters of liquid radioactive wastes were stored 1,500 m deep in quartz sandstone beds. The cost of storing 1 cubic meter of liquid waste is slightly over 4 rubles. Highly radioactive wastes are solidified (mostly by vitrification) and are also buried underground.

Other methods used by Soviet specialists include mixing the wastes with cement, forming radioactive ceramic blocks, or converting the wastes into chunks using bituminous substances. However, the first of these techniques adds to the transportation costs (cement is heavy!), and the second has not been fully tested. The greatest hope seems to lie in the bituminization process, which makes the wastes highly resistant to water. The cost of solidifying 1 cubic meter of liquid waste is 70 rubles, whereas steel containers cost 200 rubles per 1 cubic meter.

While the minibus makes its way back to Voronezh, the thought occurs to me that although perhaps not much is said here about radioactive wastes, a great deal is thought.

See Kozloduj and...go on

We come to the Kozloduj Atomic Power Plant. If engineering is beautiful, then the Kozloduj power plant is beautiful. "We added our Bulgarian architecture to Soviet technology", we hear later from director Dichev, under whose direction over 6 billion kilowatt-hours of electric power was produced in 1978, for a total of 25 billion kilowatt-hours. Construction began in 1969. The first nuclear reactor in the Balkans--the VVER-440, of course, began operation in 1974. The second followed the next year. Operation of the first VVER-1000 reactor should begin during the middle eighties with another one to start up during the same decade. Bulgaria plans 3,760 nuclear megawatts in Kozloduj on the Danube.

On 4 March 1977 the earth rocked under the six-meter "floating" asphalt bed of the Kozloduj reactors. An earthquake with its epicenter in Romania extended all the way to here. The power plant continued to operate, although at reduced capacity, transmitting power to Romanian cities, among other places. Reactors were shut off only after several hours. There was no damage. "We have confidence in Soviet engineering, which was thoroughly tested in Novovoronezh", adds the director. Water from the power plant flowing back into the Danube is 0.1 degree warmer, and this is when the water level is low. Liquid radioactive wastes are stored on the site and solidification tests are underway. After Harrisburg, safety devices that would interrupt the operation of the reactor in case of operator error were installed in the control system.

Director Dichev has had many months of experience in Soviet nuclear power plants. He was in Yugoslavia recently, in Krsko, Slovenia, where the Americans are building a 632 MW nuclear power plant. Perfection among atomic experts is considered to be not only a professional responsibility, but a moral one also. The architecture of the Kozloduj plant was designed by Maria Traykova.

In Paks and on the Buda Hills

The Paks nuclear power plant is 6 km from the Danube. The chief engineer, Erno Balogh, speaks Russian easily. The first reactor bay is 90 percent finished and the assembly of the first 220 MW turbine for the first 440 MW unit is beginning. In Plzen, the VVER-440 reactor for Paks is undergoing final inspection tests. Four such units will be in operation by 1985. In addition, assembly of two VVER-1000 reactors is planned. In the early nineties the Paks power plant will supply about 30 percent of the total electric power used in Hungary.

There are 7,300 workers employed on the construction site. The structural workers work 10 days, then have four days off; the assemblers have six days off after eight days of work. The international group of specialists, 300 of them, has been headed by engineer Ivan Prokopenko for the past three years (he was formerly in Novovoronezh for 18 years).

The next day we make a short trip to the Buda hills to the Atomic Energy Institute of the Hungarian Academy of Sciences. Dr. Zoltan Szatmari, science director, talks of research being conducted to ensure safe and reliable operation of the Paks power plant. Methods have been developed for measuring radiation in the power plant area, problems of removing heat from the reactor active zone have been examined, and a computer simulation has been made of various failures. A large group is working on a computer system for hierarchical control of reactor operation.

--"After Harrisburg we debated whether such a breakdown could occur in a power plant with a VVER-440 reactor. We decided that it could not because it has more cooling cycle pumps and more steam generators than the American reactor. We cannot exclude the possibility of some other kind of failure, however. That is why new studies are always necessary", concludes Dr. Shatmari.

The cooling system is a critical part of every reactor. Therefore, the Institute has built, to actual size, a complete VVER-440 primary cooling cycle which is subjected to brutal testing.

Technological Revolution in Plzen

To be a day late and not witness the historical moment of the final assembly of the first nuclear reactor in the Skoda Plzen plant--how unlucky can a journalist be? Standing before the huge doors closing the linear accelerator chamber, we take director Milosov Port at his word when he says that as of yesterday Paks' VVER-440 is behind those doors (engineer Balogh has been fully informed as to what is happening to his reactor). We wander around the new bay (22,000 square meters, built at a cost of 1.3 billion korunas) and look at the next reactors coming up. Today about 40 percent of the plant's production is nuclear power equipment. This figure leaves no doubt on how closely the economic fate of an enterprise and its expansion in Plzen are linked to a very difficult production. The main specialties of the Plzen staff are pressure vessels, 220 MW turbogenerators, and, of course, reactor assembly. Subcontractors, in turn, manufacture separators, compensators, and steam generators.

The decision to produce VVER-440 reactors in Plzen was made two years before their assembly was begun in the Soviet Union. The agreement on Czechoslovak-Soviet collaboration in this area was signed in March 1974. Matters proceeded quickly: During 1976-1979, Czechoslovakia spent 6 billion korunas on essential investments, of which 2 billions was allocated for additional financing of the Skoda Plzen plants. The remaining manufacturers in this sector are Vitkovicka Steelworks and Machinery Factory, the Machinery Construction Plant in Thmace, and SIGMA Olomouc. Nuclear reactors from Plzen will operate in Czechoslovakia as well as in other socialist countries. Domestic needs are large. In the Jaslovske Bohunice nuclear power plant experimental testing of the second VVER-440 unit is underway. The next two units will be Czechoslovakian. Four reactors, also 440 MW each, will be installed in the Dukovany power plant now under construction in southern Morava. The next four will begin operation after 1985 in the Mohovce plant in Slovakia. Plzen reactors will be furnished first to the NORD nuclear power plant in the GDR and to the Paks plant in Hungary. By 1985 a total of 19 reactors bearing the Skoda Plzen firm name will be produced. Ten of them will supply power to Czechoslovakia and ten are already earmarked for export to CEMA countries.

Plans are long-range. Production of type VVER-1000 reactors, 1000 MW capacity, will begin in 1985. By 1990 probably ten such reactors will be produced, four for the CSSR and six for other CEMA countries.

In looking at the production line in the newly built reactor bay we are ready to share our host's optimism. Why? Because the work is being done calmly, unhurriedly, which is always an indication that the work is going well. "Above all, accurately", adds director Port. Production of one reactor takes 36 months, of which 35 percent of the time is spent on inspection. All workers are trained three months in preparation for the job. Six reactors are under construction--four are in the metallurgical stage, two in the assembly stage. The finished VVER-440 reactor weighs 400 tons. Its complexity is revealed in the fact that it is made up of two-gram components, and a 200-ton component. Another thing--cleanliness. When I reached out to touch a shining, smooth surface, the engineer escorting me grabbed my hand. "Aren't you overdoing it?" I asked in surprise. "Perhaps. But those are the rules".

Skoda employs 45,000 workers--every fourth resident. There are few families in Plzen in which no one works in the "Skodovka". But for sure there are no families in which Plzen beer is not drunk. Its excellent taste is attributed to the local water. Could that be why the light-water reactors guarantee high quality?

Reflections on the Hole in Berzdorf

Looking into the large hole of the deepest brown coal open pit in Berzdorf, GDR, one understands why mining costs are rising. The capital-intensiveness is visible to the naked eye. Also, as we recall from a conversation with Dr. Elste Klaus in the Ministry of Mining and Power Industry in Berlin, water must be drained from two-thirds of the beds and the outlay per ton of coal amounts to 4 cubic meters. Hydrological conditions worsen each year. Extraction of 375 million tons of brown coal annually requires additional hundreds of millions of marks in investment outlays (in 1990, 300 million tons are to be extracted). But there is a fallacy here: On 1 January 1979 the capacity of operating power plants in the GDR was 4 MW, at an installed capacity of 16,000 MW. Almost half the electric power during those critical days was supplied by the Hagenwerder power plant, whose belching chimneys can be seen from a distance, on the other side of the 200-meter hole.

Brown coal reserves are 18 billion tons--not all that much. The GDR imports crude oil and natural gas, which affects the balance of payments. It is small wonder that nuclear energy is looked to for future development.

The first experimental nuclear power plant, 70 MW capacity, was started up near the town of Reinsberg in 1966. Later,

during 1973-1978, three VVER-440 reactors successively went into operation in the NORD power plant in the Rostock region (the fourth will start up in 1980 and the next four by 1990). Construction of a second large nuclear power plant in the Magdeburg area will begin in the eighties. About 1985, nuclear power plants should produce over 10 percent of the electric power used in the GDR. It is interesting that no 1000 MW capacity reactors are planned.

Radioactive wastes in the GDR, as distinct from other CEMA countries, are stored in underground salt rock caves. This is justified on the basis of high population density of high concentration of buildings. This method, according to assurances from specialists, is equally safe for wastes of low radioactivity and highly contaminated wastes. There are people in the GDR to whom the odor of burned briquettes is offensive.

Shared Optimism

Professor Aleksandrov, president of the USSR Academy of Sciences, in his private capacity a leading atomic expert, sees the development of nuclear power as the only solution to the energy crisis. He has expressed himself affirmatively many times on the feasibility of using nuclear energy directly in technological processes.

Prof P. J. Nowacki, a distinguished Polish academicians, at the last Warsaw conference of the UNIPED described the actual feasibility of using high-temperature reactors in coal conversion chemical processes.

A. Petrosianc, chairman of the CEMA Permanent Commission on Peaceful Uses of Atomic Energy, has frequently spoken in behalf of all its members on the prospects of rapid development of nuclear energy in the socialist countries. The numerous and dynamic efforts in this area are well known.

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CSO: 5100

NUCLEAR REACTORS PRODUCED FOR DOMESTIC, FOREIGN MARKETS

AU023113 Prague LIDC . DEMOKRACIE in Czech 29 Feb 80 p 3 AU

[Article signed "LIK": "The Skoda Plant's Nuclear Future"]

[Text] In exactly 5 years and 10 months time, by the end of 1985, the projected output of the nuclear powerplants in Czechoslovakia should enrich our energy balance sheet by a full 3,520 megawatts. In the course of the Eighth and the Ninth 5-Year Plans the number of our nuclear powerplants should be increasing at an even faster rate...in short: In the next few decades atoms will have the decisive say in energy.

On the basis of an agreement on multilateral production specialization and cooperation and on mutual deliveries for the installations of nuclear powerplants, which was signed last year, the Skoda plant in Plzen is becoming one of the decisive producers and suppliers of nuclear engineering components. Let us disregard today the period of preparations and let us have a look at the "atomic present" of the Skoda Plzen sector enterprise and on its plans for the future.

The Skoda plant in Plzen has been entrusted with the production of the "hearts" of nuclear power stations--the reactors themselves. It is true that the reactor vessel is not the most complicated installation of the nuclear powerplant (separators or steam generators are certainly more complicated) but its production places the highest demands on people. That is logical because, as has already been said, it is the heart of the power station and must endure throughout the years of its operation. It must be the most reliable element, which must endure the pressure and heat that are generated within it during the fission reaction.

According to the aforementioned intergovernmental agreement of the CEMA states, by 1985 the Skoda plant must produce a total of 19 complete light water reactors of the VVER 440 type. At present the Plzen engineering workers have six pressure reactor vessels in process, which are designated not only for us but for other CEMA states as well. For example, this year two reactors will be delivered to the project of the Hungarian nuclear powerplant in Paks; next year another one will be delivered to the Nord power station in the GDR, and so on. For the time being the Skoda plant is being assisted in reactor production by the Vitkovice plant where the individual rings of the pressure vessels are being forged; as of this year's end it will no longer be necessary to transport those rings between Plzen and Ostrava because Skoda will get a large forging press of its own.

What will the future deliveries of the Plzen engineering workers for our own nuclear powerplant projects look like? The first power station of the Voronezh type V-1 in Jaslovske Bohunice has reactors which were produced for us by the Soviet Union. As a matter of interest we add that the second reactor will begin to operate there in a very short time. The "twin" of this powerplant, the V-2 power station, which is also being built in Jaslovske Bohunice, will already be equipped with two Vver 440 reactors from Plzen. It should be put into operation between 1982 and 1983. The construction of our third power station of the same type--which will be equipped with four reactors, in contrast to the preceding two power stations, and will thus have twice the output--is gathering momentum in Dukovany in South Moravia. The first bloc of the Dukovany power station should begin to operate by 1 March 1983. The whole power station will be completed in 1985. Between 1985 and 1986 another power station with four 440 megawatt blocs (and, naturally, with four reactors from Plzen) will be put gradually into operation in Mochovce in Slovakia. Finally, in 1987 the first of four 11,000 megawatt blocs will be launched in Malovice, South Bohemia.

We have thus reached the topic of the nuclear prospects of the Skoda employees. Just as they have had to become familiar with and master the production of the Vver 440 reactors (the figure signifies the energy output in megawatts) now they have to prepare themselves for the production of reactors, the output of which will be substantially higher. After all, the production of the Vver 1,000 reactor must start as early as 1985. During the subsequent 5-year period they must master the production of reactors with an output of 1,500 and 2,000 megawatts, to say nothing of the fact that at the same time the Skoda plant will begin to prepare itself for the production of reactors with so-called fast neutrons, which should be applied in our energy sector some time after 1990.

In the sphere of nuclear engineering the Skoda economic production unit is thus becoming--along with Vitkovice--the main Czechoslovak partner of the Soviet Union with respect to the deliveries for the future nuclear powerplants throughout CEMA--it is a program that reaches into the next millenium. In this context it is not without interest that at present negotiations are being held with the Soviet Union on the possibilities of deliveries of nuclear power installations to so-called third markets also.

CSO: 5100

HUNGARY

HUNGARIAN NATIONAL ASSEMBLY DISCUSSES NUCLEAR POWER

LD061914 Budapest Domestic Service in Hungarian 1100 GMT 6 Mar 80 LD

[Excerpts] The National assembly met in session at 1100 today. Julia Tardos reports from the Parliament building:

At present Deputy Premier Gyula Szeker is addressing the National Assembly on the draft bill on nuclear energy.

The draft bill on nuclear energy was submitted to the National Assembly by Imre Markoja, minister of justice. In his speech he said that accelerating scientific development and the ever greater need for energy has led to the use of nuclear energy in an increasing number of countries, rapidly developing the capacity of power stations. Our first nuclear power station, at Paks, will have a capacity of 1,760 megawatts. It will be completed by 1985.

Imre Markoja spoke also about the fact that, for a number of reasons, nuclear energy is feared in many parts of the world. The concern can be understood if we think of Hiroshima, yet it cannot be accepted. The nuclear energy industry is safer than any other. It does not pollute the environment as much as power stations using coal or oil. Its equipment is of the highest quality from a technical point of view. Moreover, it will be staffed by the best specialists.

Now that a bill is being submitted on nuclear energy, said Imre Markoja, it must be mentioned that it accords with the 20-year old energy law and with the 1976 act on the protection of the environment. The justice minister stressed the importance of the fact that the bill declares that in the Hungarian People's Republic nuclear energy can be used only for peaceful purposes. This fact accords also with our international treaty obligations. Nuclear energy is a state monopoly in our country and we cooperate with the CEMA countries in its utilization. We also support the work of such organizations as the IAEA.

After the report by the justice minister, Deputy Miklos Vida conveyed the views of the National Assembly's Industry Committee.

The following observation made by the deputies should provide food for thought: Our engineering industry's share of the deliveries for Paks amounts to only 20 percent of the total, the rest being imported. If we add what was said by Gyula Szeker a few minutes ago, namely that this is the most modern investment project in Hungary, then there is really something here for our engineering industry to think about.

At present Gyula Szeker is speaking. The deputy premier has so far talked about the draft bill. Like the Justice minister, he stressed that nuclear energy must serve only peaceful ends in our country. He then went on to say that at present we import half of our energy requirement, yet this import is becoming increasingly difficult, placing a heavy burden on the economy. Thus the utilization of nuclear energy is important for us. What is more, in the words of the deputy premier it is inevitable.

The most important [word indistinct] part of our energy sources during the Sixth 5-Year Plan period will come from the Paks power station. By the end of the plan period it will provide one-fifth of the country's energy needs. The first reactor will be switched on in 1981. The possibilities of expanding our nuclear energy capacity by the end of the eighties and in the nineties is already being studied.

Gyula Szeker outlined the data in connection with the construction of the Paks atomic power station. He discussed the technical aspects of our first nuclear power station, as well as the value of the work being done there.

The debates which have taken place in the various capitalist countries concerning the safety aspects of nuclear power stations are also well known in our country. These debates are usually rooted in a whole series of political and commercial interests, Gyula Szeker said just a few seconds ago.

Although radiation material can unquestionably represent a danger, here everything is being done to insure complete nuclear safety. The guarantee for this is provided by the technical construction of the Paks power station and, naturally, by its skilled operation.

The deputy premier also mentioned the fact that in recent years a new industrial branch has developed in our country. This is uranium [word indistinct], the production and utilization of isotopes. Machinery and installations are being manufactured on the basis of our research, utilizing nuclear energy to the benefit of our country.

CSO: 5100

INTER-AMERICAN AFFAIRS

VISITING ARGENTINE MINISTER ON AERONAUTIC, NUCLEAR COOPERATION WITH BRAZIL

PY051525 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 4 Mar 80 p 5 PY

[From the Brasilia agency]

[Excerpt] An agreement on cooperation between Brazil and Argentina in the aeronautics and nuclear fields was termed "possible" by the Argentine Air Force Commander Lt Gen Omar Graffigna who arrived in Brasilia yesterday on an official visit at the invitation of Aeronautics Minister Delio Jardim de Mattos.

According to Graffigna, who is also a member of the Argentine Government, the possibility of an agreement between the two countries in the various fields in which they have mutual interests is "convenient." He therefore stressed that he believes, first of all, that it is important that "contacts be made between the authorities of the two countries," recalling that this is the reason for his visit to Brazil. He stated that during his 7-day visit he will hold talks with De Mattos and with Brig Gen Leonardo Teixeira Colares, the air force chief of staff, and with other officers of the Brazilian Air Force to "strengthen the current ties that exist between the two air forces." noting that he is convinced that "in such difficult times as those the world is experiencing, this awareness and dialog are important."

Within this reasoning he asserted that cooperation between the Argentine and Brazilian air forces and aeronautics industries is very important. "It is common knowledge," he said, "that in more developed countries, including those of Western Europe, common projects are carried out by two and even three countries. With this viewpoint in mind and with very favorable circumstances, a start can be made for future cooperation between our air forces and our aeronautics industries."

He did not reject the possibility of manufacturing a Brazilian-Argentine binational airplane, stressing that he knows about the Brazilian aeronautics industry and that it has very important projects. "I believe," he stressed, "that it would be very convenient to implement a joint project in the future."

CSO: 5100

INTER-AMERICAN AFFAIRS

NUCLEAR AGREEMENT BETWEEN COLOMBIA-BRAZIL POSSIBLE

Rio de Janeiro O GLOBO in Portuguese 26 Feb 80 p 7

[Text] Brasilia (O GLOBO)--Minister of Foreign Affairs Saraiva Guerreiro announced yesterday that he will visit Colombia 17, 18 and 19 March on the invitation of Colombian Minister of Foreign Affairs Diego Uribe Vargas. Guerreiro said some cooperation agreements should be signed during the visit and admitted that if there were to be interest by the Bogota Government and a willingness by Brazil, he could sign a document in the field of nuclear energy.

The trip by Guerreiro to Colombia is not going to pave the way for a visit by President Joao Figueiredo because, as the minister of foreign affairs explained, it is not possible for the president to go to that country this year.

The coal agreement signed with Colombia in 1976 will not be one of the subjects to be discussed during the visit by Minister of Foreign Affairs Guerreiro. He explained that various phases of the agreement have already been completed and that negotiations between the pertinent companies (the Colombian and SIDERBRAS [Brazilian Iron and Steel Corporation]) are now underway for the creation of a binational company for the exploitation of coal.

Venezuela should also be a partner in the agreement because it has an area close to that of Brazil, there being the possibility that a trinational company could be created if all interested parties can reach an agreement, since there is also a common interest in the construction of a railroad for removing the coal produced.

Minister of Foreign Affairs Guerreiro asserted that the agreement is beneficial for Brazil, primarily because the coking coal found in Colombian mines is considered to be of very high quality. There is also the possibility of Polish participation, since Poland has great experience in the field and could provide the necessary technical experience.

Colombia, as an Amazon Region country, yesterday deposited the document of ratification of the Amazon Cooperation Treaty, created in July 1978 through an initiative of Brazil. The ceremony was held at Itamaraty and attended by Colombian Ambassador German Rodriguez Fonnegra.

ARGENTINA

ATUCHA PLANT TO BE OUT OF SERVICE FOR ONE MONTH

CNEA Report

PY151618 Buenos Aires TELAM in Spanish 1414 GMT 15 Feb 80 PY

[Excerpt] Buenos Aires, 15 Feb (TELAM)--The National Atomic Energy Commission (CNEA) reported late this afternoon that the electrical system of the Atucha nuclear plant will be disconnected for 1 month for maintenance purposes as scheduled.

Although nothing has been reported on the impact this will have on consumers of electricity, it is estimated that the supply of electricity will not be affected, since the current volume of hydroelectric energy available is adequate for normal needs.

FRG Experts Arrive

PY161246 Buenos Aires NOTICIAS ARGENTINAS in Spanish 1955 GMT 15 Feb 80 PY

[Excerpt] Buenos Aires, 15 Feb (NA)--A first contingent of 15 FRG experts arrived in this capital today. Beginning tonight, and for the next 4 weeks, they will perform maintenance work on the Atucha nuclear plant, which has been shut down to have its systems overhauled. The group, part of which arrived yesterday and part today, comprises only half of the team of FRG experts who will come to perform routine maintenance service after the nuclear plant is disconnected from the national energy network. The other half will arrive in successive flights from Europe, responsible sources announced.

This is the second time the Atucha nuclear plant has been shut down for general maintenance work. Since the plant went into operation in 1974, maintenance work on it has been done only in 1977, although Nuclear Plants Director Julio Cosentino said in 1979 that "experience indicates maintenance work is needed every 14 months."

CSO: 5100

'O ESTADO DE SAO PAULO' INTERVIEWS FOREIGN MINISTER SARAIVA GUERREIRO

PY041946 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 2 Mar 80 p 8 PY

[Interview with Ramiro Saraiva Guerreiro, Brazilian foreign minister, by O ESTADO DE SAO PAULO journalists Carlos Chagas, Walder de Goes, Laura Fonseca and Carlos Conde--date and place not given]

[Excerpts] [Question] How do you view the nuclear accord between the FRG and Brazil? Can the conclusions of the INFCE--International Nuclear Fuel Cycle Evaluation Conference [as published]--against transferring nuclear technology to developing countries lead to new international pressures?

[Answer] The conclusions of the various working groups of INFCE are highly qualified, as the nature of the issue requires. There is, in fact, some emphasis that developing nations should have nuclear technology only if there is a big enough market, that exploitation of uranium should be their first priority in the nuclear field.

These conclusions are somewhat biased. For example: they indicate that to be economically feasible a nuclear powerplant should produce 600 mW, and that its power output should be equivalent to at least 10 percent of the overall power output of the country. This means that a country with less than 6 million kW cannot justify having a reactor. Obviously, these are general recommendations which should be viewed with some reservations because they will not fulfill the needs of every country.

I think that Brazil's overall installed capacity for the production of power is 30 million kW. It is estimated that by the end of the administration this figure will rise to 50 million kW. For this very reason we could justify having nuclear reactors. As far as access to technology is concerned, each case should be considered individually. It does not make any sense to establish abstract formulas which would give rise to a policy of not giving developing countries access to nuclear technology. Some countries may be able to justify a nuclear plant and others may not. However, we do not believe that it is right to draw conclusions about the nature of the international nuclear policy.

[Question] When the German intellectuals discuss the [Brazil-FRG] nuclear accord and its feasibility, they tie it to Brazil's paying and importing capabilities and its current economic status. Do you believe that this could become a restricting element for the accord?

[Answer] I believe that the nuclear program is not overexpanded for Brazil's capabilities, for what the country will be in 15 or 30 years. On the contrary, I believe that program is in perfect keeping with our status and the foreign situation. It is obvious that on a year-to-year basis there will be times when this program will look too large; there will be some years when the balance of payments is in bad shape. However, neither the Germans nor we believe that a program of this kind could abide by a mathematically perfect schedule, regardless of whether it is implemented with our own means or with foreign cooperation. This, however, is not something which can weaken the justification for the program and its implementation. Brazil is a trustworthy partner; it would never repeal an agreement unless there was mutual agreement with the other party.

[Question] This problem of the program, which is ever increasingly behind schedule, is once again giving rise to claims that Brazil is importing a technology which will be obsolete in a very short time. Since the work is behind schedule, it will become obsolete even sooner. How do you view this problem?

[Answer] This does not seem to me a valid reason, because the various technological innovations take a long time before they can be effectively applied to industry. We are so backward that any reduction of the gap between us and the countries that have the most modern technology is always advantageous, because it is very difficult for a country to attain the most advanced phases of technology without first going through the preceding ones.

[Question] Do you believe that U.S. pressures against the accord have been discontinued or just postponed?

[Answer] Our relations with the United States in connection with this issue, as well as other matters, are very good. We have no specific problem at this point. We must not worry about speculations which have no practical effect on the relations between the two countries.

CSO: 5100

BRAZIL

MINISTER SAYS NUCLEBRAS BUDGET SET BY FIGUEIREDO

Budget 'Is Sufficient'

PY151242 Rio de Janeiro O GLOBO in Portuguese 14 Feb 80 p 25 PY

[Text] Brasilia (O GLOBO)--Mines and Energy Minister Cesar Cals stated yesterday that the 15.1-billion-cruzeiros budget established for NUCLEBRAS [Brazilian Nuclear Corporation] "is sufficient for the company's investment program this year, including the fuel cycle program."

Cals stated that the NUCLEBRAS budget was established according to guidelines set by President Figueiredo. "The ceiling has been established according to a proposal made by NUCLEBRAS itself," he said.

Nevertheless, a NUCLEBRAS source had confirmed that NUCLEBRAS had asked for 19 billion cruzeiros. In a written answer to reporters, Minister Cals stated that the 15.1-billion-cruzeiro NUCLEBRAS budget "is included among the priority allocations previously approved by the mines and energy and planning ministries."

2-3-Year Delay Seen

PY161723 Sao Paulo Radio Bandeirantes Network in Portuguese 1545 GMT 16 Feb 80 PY

[Text] According to a high-ranking source of the Mines and Energy Ministry, the Brazilian nuclear program will be delayed 2 or 3 years because of cuts in the budget of the Brazilian Nuclear Corporation. The same source pointed out, however, that the fact that the program will be delayed does not mean that it will not be implemented in full.

The official acknowledged that the slowdown in the implementation of the program is a result of the government's anti-inflationary policy, which has led to a reduction of federal allocations for all programs and projects.

CSO: 5100

BUDGET CUTS TO CAUSE NEW DELAYS IN NUCLEAR PROGRAM

Sao Paulo FOLHA DE SAO PAULO in Portuguese 16 Feb 80 p 5

[Text] Brasilia--The Brazilian Nuclear Program will suffer a setback of 2 or 3 years with respect to its original timetable due to the cuts made in the NUCLEBRAS [Brazilian Nuclear Corporations] budget, it was revealed by a high source of the Ministry of Mines and Energy. This information confirms the confidential information given to FOLHA by two ministers of state about the delay in the program because of the budget cut, which was of nearly 30 percent with respect to the resources allocated the previous fiscal year.

The high Ministry of Mines and Energy sources emphasized that the "deceleration of the nuclear program is the result of the anti-inflation policy of the government, which reduced federal expenditures in all programs," and he said that despite the delay, the nuclear program will be completely executed "on the express recommendation of President Joao Baptista Figueiredo." The source discarded the possibility of a cancellation of the Brazil-German accord.

The Acknowledgement

Since the rise of reports saying that NUCLEBRAS would not have enough resources for carrying out the nuclear program within the forecast periods, the minister of mines and energy tried to deny that possibility. It was declared that the resources approved had been based on the budget requests of NUCLEBRAS itself and, therefore, could not be thrown out of phase. Moreover, it was asserted that the amount authorized for expenditures throughout that year would be enough for maintaining the program up to date without any lags.

In view of the information provided by two ministers of state, the minister of mines and energy was not able to evade the question: finally he agreed that there will be a delay and a deceleration of the program, which in the Geisel administration had the greatest priority among government programs.

Actually, NUCLEBRAS requested resources of about 20 billion cruzeiros in its budget requests to insure the maintenance of the rate which had been given to the nuclear program. The government, however, through the Special State Company Oversight Secretariat (SEST) of the SEPLAN [Planning Secretariat] granted authorization for NUCLEBRAS to spend only 15.1 billion cruzeiros this year. This sum, as was admitted yesterday by a high source of the Ministry of Mines and Energy, is not enough to insure meeting forecast periods of the nuclear program this year, leading to delays in the established timetable.

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CSO: 5100

NUCLEBRAS PRESIDENT VIEWS NUCLEAR PROGRAM TIMETABLE

PY051932 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 1 Mar 80 p 5 PY

[Excerpts] Brazilian Nuclear Corporations [NUCLEBRAS] President Paulo Nogueira Batista has confirmed the government's decision to proceed with the nuclear program in the terms in which it was originally designed. In the 1980 budget, 10 billion cruzeiros were allocated for the Angra 1, Angra 2 and Angra 3 projects and 2 billion cruzeiros for preliminary studies regarding nuclear plants 4 and 5, for which sites have not yet been selected.

Batista has also said that the Nuclebras Heavy Equipment [NUCLEP] plant in Itaguaí will begin operations next month to manufacture components of the steam generating system for nuclear plant 4 and the pressurizer for Angra 3. To show that the nuclear program will continue as originally planned, Batista mentioned the fact that heavy components for the reactor of plant 4 will begin to be manufactured in April, although no location has yet been chosen for it. He said: "We are keeping the scientific timetable."

The NUCLEBRAS president admitted that the initial construction timetables for nuclear reactors have to be reviewed "because experience has demonstrated that 7 years for the construction of each reactor is unrealistic, and so we are extending that time by 2 years." Batista said that nobody should really speak of delays in the overall timetable because, even with the time modifications, the nine nuclear plants--Angra 1 plus eight under the nuclear agreement with the FRG--should be generating electricity by 1995. He added: "Even before that time, in 1980 [as published], the uranium enrichment unit should be in full operation, producing enriched uranium for our reactors."

Regarding the reprocessing of uranium fuel, Batista predicted that Brazil will be able to have a commercial unit in operation only after the year 2000 because it takes 30 reactors in operation to make economically viable a spent-fuel reprocessing plant on a commercial scale. "But before that we will build a pilot unit first and an experimental unit later."

Acting President of the National Nuclear Energy Commission Rex Nazare said that plant 3 will indeed be built in Itaboraí Beach near the Angra 1 and Angra 2 plants to save on infrastructure cost.

CSO: 5100

BRAZIL

COST OVERRUN OF \$240 MILLION PREDICTED FOR ANGRA II

Sao Paulo FOLHA DE SAO PAULO in Portuguese 16 Feb 80 p 5

[Text] Rio--The additional financial cost for the Angra II nuclear powerplant will be \$240 million (\$10 million per month) as a result of the 2-year delay required for reinforcing the foundations of the reactor site. The information was provided yesterday by Furnas Electric Powerplants, correcting the statement made the day before yesterday by the president of the company, Licinio Marcelo Seabra, that the additional costs would be \$240,000.

The reinforcement itself--the injection of concrete into the heads of the piles already existing and the construction of floating piles--will cost nearly \$50,000 per unit according to the president of the company.

That means that those extra expenditures will be added to the overall cost of Angra II, which is estimated at \$3,237,000,000 in money current in January of this year, without including nuclear fuel. Angra I is now budgeted at \$1,246,000,000, excluding the price of the first load of enriched uranium, which according to Licinio Marcelo Seabra will cost nearly \$50 million. Since the Angra II powerplant has double the power of Angra I, it can be concluded that its uranium load will be much more expensive.

With respect to engineering services for Angra II--not only for reinforcing the foundations--provided by KWU through NUCLEN [NUCLEBRAS [Brazilian Nuclear Corporations] Engineering, Inc.], the information provided by Furnas is that it will cost nearly \$100 million by the end of this year.

Who Pays For What

The question now is who is going to pay for the new plans prepared by the KWU for reinforcing the foundations as required by the CNEN (National Nuclear Energy Commission) in March 1979, with full subsequent approval by Minister of Mines and Energy Cesar Cals, who declared that the safety of nuclear installations was a matter of priority. That statement,

moreover, was made at the time when the U.S. nuclear powerplant at Three Mile Island had its accident.

The argument as to the error in the plan and the financial responsibility for it is **not** new. In the many meetings held among the technicians of the CNEN, NUCLEN/KWU and Furnas last year, NUCLEN and KWU argued that the figures for the foundations prepared by the German Czerna Institute assured a sufficient degree of protection and were adopted in other parts of the world.

They said that the CNEN wanted the foundations to be supersafe and capable of withstanding earthquakes with an intensity of eight points on the Mercalli scale, which if they occurred would topple all the buildings in Rio and Sao Paulo.

Against those arguments, the CNEN turned to the advice of Professor Wolff of the Swiss consulting firm Elektrovatt, and later on obtained the support of three "tie-breaking experts" contracted especially by Furnas for \$12,000 to provide advice on the matter.

On the subject of safety, CNEN President Hervasio de Carvalho made it clear that any accident in the nuclear powerplants, in addition to the extremely serious damage imaginable, would cause irrevocable harm to the image of the Brazilian Nuclear Program and to the nuclear energy development of Brazil itself.

However, while it may not be described as an "error by KWU," as was stated by the president of Furnas, it has in no way been determined--despite the fact that many technicians have an opposing opinion--that Furnas has to pay for the plans which were redone because of safety considerations. The transfer of technology for the construction of nuclear powerplants by the KWU could be less mechanical and adapted to the standards of the receiving countries.

8908

CSO: 5100

BRAZIL

PHYSICIST SAYS NUCLEAR ACCORD WITH FRG IN BAD SHAPE

PY210109 Porto Alegre Radio Guaiba in Portuguese 2150 GMT 20 Feb 80 PY

[Text] The Brazilian-FRG nuclear accord is in such bad shape that it does not matter what the Vienna conference will decide about the fuel cycle. This statement was made by the secretary general of the Brazilian Physics Society when he was apprised of the news that France and the FRG had decided to stop exporting sensitive technology, that is, technology for the recycling and enrichment of uranium.

This decision directly affects the FRG's nuclear agreement with Brazil. According to scientist Luis Pinguelli Rosa, the only thing the FRG cares about in the nuclear accord is selling reactors, and the fuel cycle technology is merely a prize for the number of reactors ordered. The physicist noted that whatever the attitude of the FRG may be, after the Vienna conference the nuclear accord can offer no guarantees that sensitive technology will be transferred to Brazil.

CSO: 5100

FUTURE OF NUCLEAR ACCORD WITH FRG DEBATED

Sao Paulo FOLHA DE SAO PAULO in Portuguese 21 Feb 80 p 6

[Text] Rio--While the president of the National Nuclear Energy Commission [CNEN], Hervasio de Carvalho asserted that "the Brazil-Germany nuclear accord is not suffering any lack of continuity or pressure," Physicist Jose Goldemberg reiterated his impression that the agreement is approaching its end, and it is now up to the Brazilian Government to "force a renegotiation with respect to the number of reactors and to obtain the maximum of technology in exchange for the enormous expenditures already made up to now."

Hervasio de Carvalho believes "There is no reason for saying that the end of the nuclear accord will result from the conclusions of the International Conference on the Nuclear Fuel Cycle because no country remained with the obligation of adopting any measure as a result of the technical exercises accomplished." The president of the CNEN will participate in the political phase of the meeting that begins 25 February in Vienna. This meeting will make the evaluation of the work of the conference.

Hervasio de Carvalho said that after more than 2 years of studies by the conference "It was made clear that the problem of horizontal nuclear proliferation is of an intrinsically political nature and depends on the sovereign decision of each country, which weighs the pros and the cons.

In his understanding, "There is a consensus today that it is not a good policy to increase security through nuclear proliferation." According to him "It would not make sense to believe that the sale of nuclear reactors and fuel cycle and the development of nuclear programs means proliferation because in this case countries such as Germany, Japan, Sweden, Spain, Belgium and so forth would be proliferating countries. It is necessary not to confuse one thing with the other and for once and for all it should be understood that there can be nuclear development for peaceful purposes."

In his opinion: "A country wishing to encourage proliferation would not follow the road of building reactors and making extremely large expenditures. There are more intelligent and more economical means for accomplishing that."

According to Herveasio de Carvalho, "It was established by a consensus among participating countries that the conference would not have the effect of a moratorium on nuclear programs; would not be a pretext for the modification of already existing treaties; the results would be distributed among all participating countries without discrimination and there would exist no political obligation to decree anything on the basis of its conclusions."

Appeal

"The government should approach Brazilian scientists, who always had the capability of developing nuclear research and technology and were pushed out of the nuclear program. If cooperation between the government and the scientists had begun in 1974, today we would be in an extremely strong position; in a position to pressure developed countries," asserted Goldemberg.

The physicist believes that Germany may reexamine its position of selling the nuclear fuel, enrichment and reprocessing cycle, as France did in its dealings with Pakistan, and now chooses to seek a rapprochement with the United States and the Soviet Union, who are opposed to the transfer of the fuel cycle by developed countries because they believe that it would lead to nuclear proliferation.

According to the professor, Germany's new position may be put into effect after the International Conference on the Nuclear Fuel Cycle. Up to now Germany has been facing a strong opposition from the United States of America. According to Goldemberg, Germany could reexamine the accord with Brazil "because it is seeing the failure of its plan to sell the eight reactors because of lags in the Brazilian Nuclear Program, losing the advantages it had attained. That intention was made very clear in the statements by German Minister of Economy Otto Von Lambsdorff during his visit to Brazil.

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CSO: 5100

BRAZIL

RUMORS CIRCULATE ON NUCLEAR PROGRAM DEACTIVATION

PY211425 Sao Paulo Radio Bandeirantes Network in Portuguese 1000 GMT 21 Feb 80 PY

[Text] The minister cannot comment on rumors. With this statement, the advisers of Mines and Energy Minister Cesar Cals refused to comment on rumors that the Brazilian nuclear program could be deactivated because the FRG refused to supply the technology which would provide complete control over the nuclear cycle, including the manufacture of the atomic bomb.

The same sources indicated that during a routine meeting with President Figueiredo they only discussed the appointment of (Ivano Humbert Marquese) as the new director of the National Nuclear Energy Commission.

CSO: 5100

BRAZIL

NUCLEAR COMMISSION HEAD DENIES INTERNATIONAL PRESSURES

PY211423 Porto Alegre Radio Guaiba in Portuguese 0200 GMT 21 Feb 80 PY

[Text] The president of the National Nuclear Energy Commission affirmed today that the nuclear agreement with the FRG is not subject to any interruption or international pressures. Gervasio de Carvalho made the affirmation commenting on reports that France and the FRG have decided not to export so-called sensitive technology at the nuclear fuel cycle evaluation conference being held in Vienna. He will attend the final session of the conference on 25 February.

According to a Brazilian Foreign Ministry adviser, the Brazilian Government is not concerned with the positions announced at the nuclear fuel cycle evaluation conference, not even with the possibility of a rigid control over the supply of nuclear fuel and the suspension of nuclear technology transfer to Third World countries. The adviser said that the information coming from Vienna is not correct and, therefore, poses no threat for the Brazilian nuclear policy. He explained that the conference is only investigating some technical aspects regarding the peaceful uses of nuclear energy in the scientific field, without any political implications.

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BRIEFS

URANIUM RESERVES--Brazilian uranium reserves should reach 500,000 tons by 1985, according to a study by the Mineral Resources Prospecting Company (CPRM). To go from the present 215,000 measured tons to that amount, four years of prospecting will be necessary. If expenditures were to increase it would only take 2 years. One of the countries with the greatest uranium reserves, Brazil is in fourth place in the West in spending on uranium prospecting: \$15 million per year, the same amount which DOCEGEO [expansion unknown], a subsidiary of Vale do Rio Doce Company, spends in the Amazon Region searching for several other minerals. We are behind only the United States--3,000 test holes per year compared to 50 in Brazil--South Africa and France. [Text] [Rio de Janeiro O GLOBO in Portuguese 23 Feb 80 p 16] 8908

DISMISSAL AT NUCLEBRAS--Gen Jose Campelo, NUCLEBRAS administrative superintendent general, has been dismissed from his position for having questioned the charter of a 12-seat executive jet to transport the president of NUCLEBRAS, Paulo Nogueira Batista, from Paris to Baghdad to negotiate the nuclear agreement with Iraq last year. General Campelo had objected to the expense involved in the charter of that jet, which sat at the Baghdad airport for 48 hours waiting for Batista, considering that there are regular commercial flights between Paris and the Iraqi capital. [Rio de Janeiro JORNAL DO BRASIL in Portuguese 8 Mar 80 p 17 PY]

NUCLEBRAS INCREASED CAPITAL--By executive decree issued today by the president of the nation, Brazilian Nuclear Corporations [NUCLEBRAS] was authorized to increase its corporate capital to 5.450 billion cruzeiros. This amount will be divided into 3 billion worth of regular shares and over 2 billion worth of special shares with a nominal value of 1.1 cruzeiro each. [Brasilia Domestic Service in Spanish 2200 GMT 3 Mar 80 PY]

NUCLEAR PLANTS CONSTRUCTION--Nuclear Centrals 4 and 5, whose installation sites have not yet been established, will go under construction this year. The budget for the electricity part of the projects totals 2 billion cruzeiros, according to a report by the NUCLEBRAS president. During a press conference granted at Planalto Palace today to clarify doubts about the nuclear program, Paulo Nogueira Batista confirmed the intention of the government to execute the whole agreement with Germany. [Text] [PY011314 Porto Alegre Radio Guaiba in Portuguese 0200 GMT 1 Mar 80 PY]

BRIEFS

NUCLEAR POWER PLANT PLANNED--Original methods for the production of uranium from the Negev phosphates are now being developed within the framework of the preparations for the establishment of a nuclear power plant. This fact emerges from next year's Energy and Infrastructure Ministry budget. The budget further indicates that the Haluza area of the Negev may be the location for the first nuclear power plant in Israel. Contacts will be made with various elements to locate organizations to participate in building the plant. In addition, 238 million Israeli pounds were allocated in the new ministry's budget for the purpose of checking the profitability of a nuclear power plant and alternative sites for it. [Tel Aviv YEDI'OT AHARONOT in Hebrew 28 Feb 80 p 6 TA]

CSO: 5100

GROUP OF URANIUM TRAFFICKERS ARRESTED IN MOUNANA

Libreville L'UNION in French 22 Feb 80 p 2

[Article by Javys Leyegui]

[Text] The officer in charge of the Mounan gendarmery, Ekome Ebozo'o and his men have arrested a band of uranium traffickers. The principal figure in this affair is Mr Boanga, a Congolese driver employed by the Matlowski Company of Mbinda, who was in charge of delivering to Mounana the materiel and products for the COMUF [Franceville Uranium Mining Company]. This is the course of events: at the beginning of January 1980, during one of his trips to Mounana, Boanga got in touch with Jean-Michel Niombi, a Gabonese citizen in charge of the team dealing with the packing of the uranium, and asked him to sell him 2 10-liter demijohns of uranium. Niombi agreed and the deal was set for 250,000 francs. On 24 January 1980, Boanga was in Mounana again. He handed his "purveyor" the two empty jugs as well as the money, and it was decided they would meet the next day. Boanga went to the rendez-vous, but did not find his seller. Instead, he met Bernard Ngana, Niombi's assistant and his partner in the deal, who took him to his supervisor, and all three went to get the demijohns filled with uranium which was hidden at the river's edge.

Grabbing his precious loot, Boanga immediately departed in his truck. Near Mounana, he fell on a gendarmery patrol which attempted to stop him to control his cargo, but he sped away. The gendarmes then reported his suspicious behavior to their chief, who then alerted the authorities at the COMUF factory. In turn, they got in touch with Matlowski in order to identify the driver.

On 9 February, Ebozo'o was informed that the thief was in his jurisdiction; he was immediately arrested and taken to the gendarmery, where he was interrogated. Boanga confessed right away, declaring that he had paid his accomplices the sum of 250,000 francs for the 2 10-liter demijohns of uranium.

CSO: 5100

SOUTH AFRICA

OPINIONS FAVORING, OPPOSING NUCLEAR POWER PLANT

In Favor of Power Plant

Capetown DIE BURGER in Afrikaans 31 Jan 80 p 25

[Text] The erection of the Koeberg Nuclear Power Station is justified for economic and security considerations, according to R. P. A. Myburg, Western Cape District director of EVKOM [Electricity Supply Commission], in a statement he made in Capetown yesterday. Myburg, who spoke at the Summer School of the University of Capetown, said that most of the electric power in South Africa is generated in Eastern Transvaal and Northern Free State. In order to supply electric power to the coastal regions it is therefore necessary to install long transmission lines.

The result of having to conduct electric power by means of such transmission lines is that about 12 percent of the power is dissipated. In addition, there is the danger that the line may be sabotaged, struck by lightning or suffer damage in other ways.

In the future, it will become impossible to build power stations near coal fields for the purpose of supplying power to the entire country, according to Myburg. There is not enough water in these regions. Moreover, this would cause serious pollution there. A large power station deposits about 10 million tons of carbonic acid into the atmosphere.

A coal type power plant which is as big as the Koeberg nuclear power plant would cost a lot of money. Such a power station would consume 16,000 metric tons of coal daily. This means that 14 trainloads, each consisting of 35 wagons, would have to be transported to Capetown every day.

In the long run, nuclear electric power is cheaper than that generated by coal. Moreover there is much less danger of pollution than in the case of coal-fired power stations.

No Advantage in Nuclear Power

Capetown DIE BURGER in Afrikaans 1 Feb 80 p 11

[Text] All development of nuclear power must be halted because it holds no actual advantage for South Africa; moreover, it holds a great deal of

danger for the public. This was the opinion expressed by W. Robb, a lecturer on economy at the University of Capetown, in a statement he made yesterday at the university's Summer School.

Although it would be expensive to transport coal to Capetown, it would be necessary to invest just as much money in the enrichment of uranium and for the storage of nuclear waste material. It would be cheaper to install long transmission lines from Transvaal to Capetown than to build the Koeberg Nuclear Power Plant.

Although it appears that coal is more expensive than uranium, the price of uranium will be increasing faster than that of coal because of the complicated system of enrichment which is necessary for uranium.

Coal is the best short-term solution for the generation of electric power. It must be employed until technology is advanced far enough for the economic utilization of wind and sun energy.

If the development of nuclear power is continued, the physical fitness of future generations will be damaged, according to Robb.

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CSO: 4408

FRANCO-ITALIAN DIFFERENCE OVER SUPER-SARA PROJECT NOTED

Paris AFP SCIENCES in French 27 Dec 79 p 23

[Article: "EEC Council of Ministers of Research: Franco-Italian Difference Over 'Super-Sara'"]

[Text] Brussels--The Franco-Italian difference over the setting up of the "Super-Sara" nuclear safety project prevented the Ministers of Research of the Nine from adopting two community programs of scientific research for the period 1980-1983.

Italy wanted the EEC to contribute to the financing of the "Super-Sara" project, which consists of simulating accidents involving loss of liquid coolant in light water nuclear reactors. Up to now Italy has underwritten all expenses of this project.

France is opposed to this, feeling that the results of the "Super-Sara" project will not be known until 1985 and that the French experimental reactor "Phebus" at Cadarache will produce results by the end of 1980.

For its part, the European commission emphasized the Italian project's superiority to "Phebus" in size, its greater complexity and the fact that it was modified after the accident at the American nuclear power plant at Three Mile Island.

France asked that the European commission study other project on reactor safety, including "Super-Sara," before reaching a final decision.

In order to protest the French position, Italy has opposed the adoption of the 1980-1983 program for research and training in the field of thermonuclear fusion costing one billion monetary units (1 UCE [European Community Unit] = Fr 5.9).

In addition, on 20 December the ministers adopted a 1980-1984 research program on radiation prevention for which a budget of 69 million monetary units was provided.

The next EEC council of ministers of research will take place in January.

9380

CSO: 5100

DENMARK

LIBERALS, CONSERVATIVES ATTACK GOVERNMENT DELAY OF N-POWER START

Stockholm DAGENS NYHETER in Swedish 14 Feb 80 p 3

[Text] Two of the conservative parties in the Danish Folketing, the Liberal Party and the Conservative People's Party, are sharply displeased with the Danish Government's new attitude toward the introduction of nuclear power into Denmark. On Wednesday, they asked the Danish minister of energy what had caused the government to alter its decision. The practical significance of that decision is that the introduction of nuclear power into Denmark is being postponed until some unspecified time in the future.

The conservative parties think that the Danish Government's indecisiveness is downright irresponsible, and they point out that because of the postponement it will very nearly be the year 2,000 before the first Danish nuclear power plant can be in operation. Among other things, there is a danger that at that time the country will be faced with very serious procurement problems, they say.

Harrisburg

Danish Minister of Energy Paul Nielsson said, among other things, that the government does not want to introduce nuclear energy before questions of safety have been solved, and that for that reason a long series of studies must be carried out. Among other things, he referred to a study of the Harrisburg accident.

The Conservative People's Party and the Liberal Party accuse the Danish government of constantly discovering new reasons for postponing the introduction of nuclear energy. The consequence of the government's attitude is that the two nuclear power plants which are to go into operation in about 1990 according to plan are being replaced by coal-burning power plants until nuclear power is found to be safe enough.

But, says Paul Nielsson, the government's basic view is that nuclear power will be introduced in Denmark if the population says "yes" in a referendum. According to an opinion poll which was taken on Sunday, nuclear power is opposed by a small majority of the population.

PROSPECTS FOR URANIUM MINING IN BLACK FOREST AREA

Duesseldorf WIRTSCHAFTSWOCHE in German 8 Feb 80 pp 20-21

[Article: "Mountain Resources for Emergency Use"]

[Text] Two of three economically usable uranium deposits are located in the Black Forest. Although there are no intentions at present to mine the precious rock, the population living adjacent to the mountain is already anxious as to how tourism will be affected.

The citizens of Baden-Baden, where the Romans once spasped in the thermal springs and which at the end of the 18th century became Europe's "summer metropolis," are worried about their city's image. Not far from Baden-Baden, in Muellenbach, there lies one of three uranium deposits in the FRG, the mining of which would be worthwhile.

Will the spa now become a mining town? If the assurances given by the representatives of the Federal and Land ministries are credible, there is still plenty of time. However, skepticism is appropriate. Citizens and aldermen of all parties believe that the deposits found will not only be investigated as to their extent, but that the mining of uranium is already underway.

According to first investigations, Muellenbach has 3,200 tons of rock containing uranium. This quantity would suffice to supply the nuclear reactors now operating in the Federal Republic for 2 years. It is thought that the Baden-Baden rock still contains as much as has been found. The Bonn Ministry for Research and Technology expects 60 times the energy content if the uranium can be burnt in "fast breeders."

In spite of this it is said that nobody is actually planning on extracting the uranium from the rock. The Federal government, the government of the Land, and Saarberg Interplan agree in stating that the uranium content of the deposits is supposed to stay in the rock for "emergency use." The Bonn government was, however, under obligation to investigate the deposits "up to complete exposure" on the basis of the Euratom convention.

There are, indeed, numerous areas in the FRG where radiation implies uranium deposits. But so far only three uranium deposits have proven economically usable: Menzenschwand and Muellenbach in the Black Forest and Maehring in the Fichtelgebirge, the two deposits in southern Germany being located in popular vacation areas. The uranium from these deposits could only be mined facing bitter resistance from the population.

No franchise holder has therefore been successful in obtaining a mining license. However, in the course of the exploration, the borders between investigation work, work preparing the mining and the actual mining which necessarily ensues in the course of the first two activities become indistinct. If there were no uranium mining, the neutralization plant planned in Muellenbach to wash out the ore from the rock would be superfluous.

If creating an "emergency reserve" for a crisis is to make sense, though, the exposure must be continued to such a degree that the uranium would be made available as soon as possible in an emergency. Therefore a complete mine would have to be set up and kept in operating condition over the years.

The "emergency" concept has now been incorporated in the draft of the "first continuation of the energy program for Baden-Wuerttemberg," which has been submitted to the associations involved for comment.

Saarberg-Interplan, legal owner of the mining franchise in Muellenbach, a company owned by the government and the Saarland by way of its parent company, Saarbergwerke, may be able to do without mining in the near future. But in Menzenschwand, where there has been prospecting since 1957, and more than twice the official 2,000 tons are supposed to exist, the prospector, "Brunhilde Union," a private mining company, is pushing the matter. Even if the prospecting work is supported by the federal government, the private enterprise must ask itself how long it can afford to continue drilling the rock but not mining any uranium, without incurring financial losses.

9544
CSO: 5100

UTILITIES PREFER NUCLEAR TO COAL-FIRED POWER PLANTS

Hamburg DER SPIEGEL in German 3 Mar 80 pp 77-79

[Article: "Soon Top Price"]

[Text] Power company managers demand authorization for more nuclear plants. Why don't they build coal-fired power plants?

Because of an electricity shortage, Klaus Knizia, head of the United Power Companies (VEW) lectured last Tuesday, there will soon "remain no steel industry in the area if we do not build nuclear power plants today."

Only two days later, Guenther Klaette, director of the Rhenish-Westphalian Power Companies (RWE) warned against the consequences of a nuclear power moratorium: nuclear power, he said, is "a must" and it must "make an important contribution in covering our future energy requirements."

Horror slogans, large-format ads and gloomy scenarios have now been used for months by Knizia, Klaette and their colleagues to shock their industrial and household customers. The dreadful pictures they conjure are aimed at creating political pressure and helping obtain new authorizations for nuclear power plants.

North Rhine-Westphalian Minister of Labor Friedhelm Farthmann, sees in the campaigns of the power companies "only that one idea, to force the competent authorities to quickly authorize their nuclear power plants."

In all their propaganda campaign for more atomic plants, the power company managers deliberately conceal the fact that they themselves could prevent the disaster--by building the coal-fired power plants which have been authorized for a long time.

In North Rhine-Westphalia, ground could be broken right now for 11 new coal-fired power plants. Construction permits are to be issued this year for nine more coal-fired power plants on the Weser, the Rhine and the Ruhr. Together, the new facilities would have a production capacity of 16,000 megawatts--almost half the output of present North Rhine-Westphalian power plants.

The new facilities could easily cover the additional consumption forecast by experts and by an internal RWE study for the period until the year 2000. At the same time, technically obsolete and mostly small older plants would be replaced by cheaper and less polluting new facilities.

Power plant constructors are ready to build the coal-fired plants. The Klockner Company in Duisburg had the site of the former Ochsenkamp mine in Castrop-Rauxel surveyed 2 years ago, at a cost of roughly DM 1 million marks, and the environmental impact was calculated. The Steag Company in Essen has even invested DM 5 million marks for preliminary work on their power plants in Grotten on the Lippe and in Siersdorf near Aachen.

but the competent regional power distributors persist in refusing to sign power supply agreements with the constructors and operators of these power plants

Only once has RWE accepted to make an exception. Under pressure from the North Rhine-Westphalian government--concerned about jobs in the Muenster area which lacks structures--the Essen company agreed to buy power from a new coal-fired power plant in Ibbenbueren. This power plant, with a capacity of 700 megawatts, will buy coal from the local Preussag mine which otherwise could hardly find customers for its expensive coal extracted from a depth of almost 1,400 meters.

The power dealers explain their resistance against power produced from coal by its supposedly higher cost. "Today, the cost of producing nuclear power," according to VEW General Manager Knizia, "is 5 pfennigs per kilowatt-hour lower than that for power from coal."

Knizia is prudently concealing the fact that the cost of nuclear power can be kept at such a low level only under one condition: The state must take care of nuclear waste removal. "The power companies," says Gerhard Wendzinski, deputy chairman of the SPD group in the North Rhine-Westphalian parliament, "speculate on the fact that the state will bear most of the costs."

On the other hand, if the state did not take care of waste disposal and reprocessing, nuclear power would soon reach a top price, as published internally by RWE management.

The active interest of power companies in nuclear power is also dependent on longer-term marketing strategies.

The power companies anticipate considerable marketing success if, in the future, as many households as possible are equipped with power-hungry heat pumps. These pumps help use geothermal heat for heating.

But the number of such devices increases in proportion as the energy policy is geared to nuclear power. Because nuclear reactors must be built away from towns, in view of the danger they represent, their waste heat cannot be used for long-distance heating systems.

This, however, is not the case with coal-fired power plants which can be built near residential districts and, therefore, can be connected to long-distance heating systems.

But once long-distance heating systems are completed, if there is no boom on heat pumps, then the power companies can no longer expect exciting sales figures.

According to recent RWE internal computer forecasts, if coal-fired power plants with long-distance heating systems are completed, the share of electricity in the overall energy supply of North Rhine-Westphalia will remain nearly stagnant until the year 2,000.

"No wonder," Social-Democrat Wendzinski said of the interest of the sector for nuclear power, "that they are not interested in coal-fired power plants."

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CSO:5100

NUCLEAR AUTHORITY ALLOWS LOVIISA I TO RESUME NORMAL OPERATION

Helsinki HELSINGIN SANOMAT in Finnish 2 Jan 80 p 10

[Article: "Production Limitation Lifted from Loviisa I Power Generating Plant"]

[Text] The Loviisa I generating plant has been granted permission by the radiation safety authorities to operate at full capacity. The plant output was governed for nearly three years by a production limitation. The limitation was imposed because the authorities felt that adequate information was lacking about the behavior of the nuclear fuel.

A recapitulation of several reports about the fuels was completed at the end of 1979. The decision to remove the production limitation was reached on the basis of this recapitulation during the renewal of the Loviisa I operating permit.

The Loviisa I limitation was at eight percent of the plant's 1,375 megawatt heat-producing capacity. The plant thus did not reach its full electrical capacity of 440 megawatts.

However, when operating at full capacity, the plant produces more than 440 megawatts. The output was increased to 470 megawatts on 1 January 1980. According to operations chief Anders Palmgren the shift occurred without problems because tests at full capacity had already been conducted briefly.

Additional information has become available about the nature of the flaws in the Loviisa II pressure container. The Finnish Imatran Voima Oy (the IVO) power corporation has received support from Atomenergoexport (the AEE) the builder of the plant for the belief that the flaws in the corrosive fluid layer in the pressure container have no effect on plant safety.

The AEE has submitted a report to the IVO stating that the pressure container does not weaken even if the flaws in the corrosive fluid layer, which is less than a centimeter in thickness, should reach through the entire thickness of the layer. According to the IVO, the Finns had already reached the same conclusion in their own studies.

The new AEE report is stated as being the most important factor in the negotiations between the radiation safety authority and the IVO in reaching the decision concerning the granting of the charging permit for the Loviisa II plant.

The pressure container of the Loviisa II plant is currently under investigation. Small surface flaws, which were detected in the dye permeation tests following the heat test, are now being studied by means of ultrasonics. The IVO is expected to complete its studies during this week, after which it will apply for the charging permit.

5955

CSO: 5100

BOTH OLKILUOTO NUCLEAR PLANTS EXPERIENCE MALFUNCTIONS

Helsinki HELSINGIN SANOMAT in Finnish 20 Dec 79 p 3

[Text] Two consecutive disturbances caused the disruption of electric power production by the TVO I nuclear generating plant of the Teollisuuden Voima Oy at Olkiluoto and the disconnecting of that plant from the national network. An unknown disturbance already last weekend caused the automatic relay at the plant to trip.

The most recent relay trip occurred on the morning of 19 December. The plant could have been reconnected immediately but, because the same disturbance had already caused three disruptions, it was decided that the cause should be determined. Electric production is expected to resume in a few days.

The second Olkiluoto TVO II plant has also had malfunctions. When it was noted during test operations that the relative moisture content in the rotor of the turbogenerator was excessive the test operation was discontinued. It was decided on 19 December to send the rotor back to Sweden to the Ab Asea, the manufacturer, for study.

Weighing about 80 tons, the rotor will be shipped by sea to Vasteras by way of Naantali. Reinstallation is expected to require about a week after return of the rotor to Olkiluoto. The length of time required for the studies in Sweden is not known at this time.

The intention was, according to the original plans, to connect the TVO II plant into the national network during late 1979. Steam was first brought into the TVO II turbine installation in early December 1979, and the turbine was set in motion on 11 December.

5955

CSO: 5100

POLL SHOWS INCREASED WORRY OVER NUCLEAR SAFETY

Helsinki HELSINGIN SANOMAT in Finnish 28 Dec 79 p 7

[Text] The number of people who have faith in the safety of nuclear generating plants has clearly decreased in Finland during the course of 1 year.

A Helsingin Sanomat Gallup Poll

The Nuclear Generating Plants Are: (by percentage of answers)	Completely or Fairly Safe		Not Very Safe, or Completely Unsafe	
Party Affiliation of Respondents	1978 %	1979 %	1978 %	1979 %
Center Party	42	30	54	69
Coalition Party	58	47	38	52
Social Democrat Party	40	33	54	65
Finnish Peoples Democratic League	37	32	59	67

A year ago 43 percent of Finns of voting age considered the nuclear generating plants to be either completely or fairly safe. As of this writing, only 34 percent of all voters remain confident of the safety of nuclear generating plants.

The Helsingin Sanomat commissioned the Suomen Gallup Oy [Finland's Gallup Corporation] to gauge the opinion of Finnish citizens by means of a question that was posed at the end of 1978 and then recently again in exactly the same form during November-December 1979. The question posed goes thusly: "In speaking about the use of nuclear power, special attention has been focused on the safety of the power plants from the viewpoint of the environment. In addition, it has been pointed out that the problems arising from the transport and storage of the dangerous wastes from the nuclear power plants have not yet been finally resolved. What is your opinion about these safety problems in general?"

The distribution of the answers received represents the views of the entire population of Finland that is of voting age.

Amount of Education Increases Trust

The number of people who considered the nuclear generating plants to be completely safe dropped from 6 percent in 1978 to 3 percent a year later. Those who considered the plants to be fairly safe dropped from 37 percent in 1978 to 31 percent in 1979. Those who elected to answer "Not Very Safe" increased from 38 percent in 1978 to 44 percent in 1979. Those who considered the nuclear plants to be completely unsafe increased from 14 percent in 1978 to 20 percent in 1979, which is one fifth of the Finnish nation. While 5 percent in 1978 had no opinion, only 2 percent expressed no opinion in 1979.

Opinions within the various population groups changed only little during the year. The misgivings concerning the safety of nuclear energy have become evenly generalized within all population groups.

The 1979 survey showed equally as clearly as the 1978 survey that the least faith in the safety of nuclear energy existed among those who had completed only elementary school. The greatest feeling of safety was among those who had completed the university student examination.

However, faith in the safety of nuclear energy has begun to falter even among those who have had the most education. While 57 percent of those who completed the university student examination considered nuclear energy to be either fairly safe or completely safe in 1978, that percentage in that group dropped 10 points in 1979 to 47.

The youngest of those surveyed (under age 25) and also the oldest (above age 50) had the greatest misgivings about the safety of nuclear energy. The age 25 to 50 group has more of those who have faith in the safety of nuclear energy than any other age group.

Those who doubt the safety of nuclear energy are now in the majority among the supporters of the four major political parties in Finland. The greatest number of doubters exist among the Center Party voters, and the largest number of those who have faith in the safety of nuclear power exist among the supporters of the Coalition Party.

5955

CSO: 5100

SWEDISH PEOPLE'S PARTY LEADS DRIVE AGAINST FIFTH N-PLANT

Stockholm DAGENS NYHETER in Swedish 20 Feb 80 p 10

[Article by Tor Hogna: "Uneasiness in Finland regarding a Fifth Nuclear Powerplant"]

[Text] Helsinki, 18 February--In Finland people are uneasy here and there about the fact that the planning of a fifth nuclear powerplant is moving ahead at full speed. That is the case before any decision has been reached in regard to the purchasing of a Russian 1,000-megawatt reactor. The problem was taken up on Tuesday, 18 February 1980, by the leader of the Swedish People's Party's group in the Riksdag, Henrik Westerlund, in a question he asked the government.

He asked whether the government is permitting the state power company Imatran Voima to enter into a planning agreement with the Soviet contractor before a decision in principle has been reached regarding the purchase of a fifth reactor.

Henrik Westerlund is a farmer in the district of Perna, which adjoins Loviisa, where two Russian-built nuclear powerplants are located. In his question to the government, he pointed out that the handling of wastes is not arranged for in a satisfactory manner. Industrins Kraft AB, which is responsible for the two ASEA [Swedish General Electric Corporation] nuclear powerplants in Olkiluoto has asked for a period of grace in which to find a solution to its problem with waste. Westerlund thinks that that means that a definitive and safe solution will not be found in the foreseeable future.

He says that Finland's energy procurement program can be benefitted by concentrating purposefully on domestic sources of energy and a program of economizing. Before they decide to enter into a planning agreement with the Soviet Union, the nation's council which deals with energy policy should be able to point to an obvious need for energy which cannot be satisfied from other energy sources.

The final decision to build a new nuclear energy plant should not be taken before the Riksdag has considered the question, Westerlund says.

In a motion submitted to the current Riksdag, Westerlund proposes that the government should decide on a plan to do away with nuclear power over a 10-year period.

The plan should go into effect immediately if a catastrophic accident occurs.

9266

CSO: 5100

GOVERNMENT PUSHING NUCLEAR POWER DEVELOPMENT

Paris LE NOUVEL ECONOMISTE in French 4 Feb 80 pp 38-45

[Article by Jacqueline Giraud: "Nuclear Power, the Obsession"]

[Text] What if France was wrong? Ignoring the hesitations of most industrialized countries, refusing the arguments of the ecologists, minimizing the uncertainties of technologies underway, the government is accelerating its nuclear program. This is a tremendous economic gamble.

"We have the most ambitious nuclear program in the world, and the world knows that, in this respect, France is engaged in a unique effort to achieve energy independence," pointed out Valery Giscard d'Estaing during his last televised talk on Channel 2, on 27 November. "This program," he specified on 18 January, on the Europe 1 channel, "is what enables us to test the perspicacity and foresight of a country."

This opinion was countered, on 23 January, by Francois Mitterrand and Edmond Maire along with representatives of 20 other organizations who are denouncing the economic, ecological, and socio-political risks of an excessive involvement and too exclusive a choice. Even though based on "foresight," the French nuclear program remains a gamble which no one knows whether it will win or lose. Its success presumes the elimination of a number of technological and economic obstacles which were not mentioned by the president of the republic.

This "unique effort," decided upon by the Pierre Messmer government, in the spring of 1974, will have its results known only in the 1980's. The first reactor of the Messmer plan, Bugey 5, was commissioned last summer. This year, six reactors were scheduled to begin operations on the sites of Blayais in Gironde, and Saint-Laurent-des-Eaux. All in all, since 1974, the decision called for the building of 30 reactors developing 900 megawatts each and 11 generating 1,300 megawatts each. Each new reactor in operation was to save between 1.3 and 1.5 million tons of petroleum out of the 100 million tons annually consumed by France.

Criticized, opposed, delayed by technical difficulties and, occasionally by local opposition to the choice of a site, the French electric power nuclear program is being implemented, therefore, in spite of major difficulties.

In this respect, as a matter of fact, it is quite unique. Elsewhere, all nuclear programs adopted in the aftermath of the first petroleum crisis, have been either blocked or substantially downgraded. The 1979 petroleum blaze has not as yet led to a real resumption. The Brussels commission predicts that the members of the European Community will have to quadruple their coal imports between now and the year 2000 to balance the shortage of nuclear generated power.

Eleven years ago, France abandoned its own set of nuclear power plants using raw uranium. The specific reason was that the industrialists did not consider themselves able to impose upon the world a technology different from the one selected by the Americans. France failed to establish its Concorde effectively. Today, is it not involved alone in an industrial adventure which is even more aleatory and infinitely more costly?

To match the acceleration of the French program, Framatome built a supermodern plant in Chalon-sur-Saone. Henceforth the enterprise, managed by the Empain-Schneider group (see The Atom Industrialists), would be able to produce six to eight reactor vessels per year. This is a capacity exceeding the current French orders which will surely decrease. Other than the two reactors which were built for Belgium, and two vessels under construction for South Africa, Framatome has no other export orders. Yet, the future balance of the enterprise rested on its hopes outside France.

"The world market is fiercely depressed," acknowledges Jacques Gaussens, Framatome director. "The United States is the main culprit. Nuclear technology was seductive because it carried the label 'American.' The cancellation of orders in the United States, aggravated by President Carter's opposition to the reprocessing of used fuel and to the fast breeder reactor has given second thoughts to most countries. However, we hope that nuclear could be restarted because the United States is undergoing a change of mind."

Indeed, President Carter's latest statements have been shaded.

"Nuclear energy is what we shall fall back on after having exhausted all other ways. However, we cannot afford the luxury of abandoning it," he stated last December. He recommended to the NRC (Nuclear Regulatory Commission) not to extend the six-month moratorium on all new authorizations for construction which had been adopted last November, at the outcome of the investigations of the Three Mile Island accident. However, this year candidate Jimmy Carter cannot preach an enhancement of nuclear in the face of his Democratic competitors for the presidency:

Edward Kennedy, who is in favor of a long moratorium, and Jerry Brown, the governor of California, who is firmly antinuclear.

He can promote it even less in the face of the fact that American public opinion was quite strongly shaken by the Three Mile Island accident. According to some it was reassuring, for there were no casualties. Nevertheless, it raises three major questions, two of which apply to France as well.

The first question: A major accident, a start of fusion of the reactor core, has been triggered by a sequence of minor accidents; such a scenario, considered entirely improbable, had not been taken into consideration in accident hypotheses which determine security norms. Second question: The plant operators, followed by the NRC experts, multiplied handling and judgment errors; America discovered that its nuclear plants seemed to be factually ran by sorcerers' apprentices. On this point the French program clearly offers superior guarantees. Third question: Nothing had been planned for the evacuation of one million people. Actually, would it be conceivable to undertake such a formidable exodus without drama? To such a point that today the NRC is contemplating the definitive closing down of two plants: Indian Point, north of New York, and Zion, near Chicago.

This final question affects even the Soviet Union which, so far, has been impermeable to nuclear objections. For the first time, in September, the very official periodical *KOMMUNIST*, a nuclear expert, Nikolav Dollezhal, and an economist Yuriy Kuzhakin, oppose the concentration of plants near major urban agglomerations in European Russia. In France, safety officials have expressed doubts as to the choice of some sites: Le Pellerin, close to Nantes, with one million population within a 50 kilometer radius; Cattenom, at the border with Luxembourg, two million residents within a 50 kilometer radius. "I believe that the Cattenom site shows, from the viewpoint of population distribution, clearly less favorable characteristics compared with most previously chosen sites," wrote to the Edf [Electricity of France] on 5 February 1978 Christian de Torquat, chief of the Central Safety Service. Nevertheless, Cattenom will "shelter" four 1,300 megawatt reactors.

Whatever President Carter's future attitude may be, the nuclear industry has not as yet paid in full for the consequences of Three Mile Island. In France the safety authorities have made deductions leading to a number of changes in instruments, safety precautions, and operational procedures. In the United States, the investigative commission appointed by the White House issued 44 recommendations all of which will have to be applied to "keep the risks within acceptable limits." Such recommendations cover such a wide number of sectors that they could not be applied in one fell swoop. This threatens to extend the unwillingness of electric power companies to go nuclear. The commission specified that even with all the suggested modifications

"there is no guarantee that severe nuclear accidents may not occur in the future."

More risky than it was thought to be, nuclear technology also appears to be more difficult than was thought. Every month has its share of incidents. One of the two nuclear reactors in the Netherlands has not functioned since 19 November: The steam generators eroded by corrosion, a very widespread sickness in American nuclear plants, had to be replaced. The Genkai reactor in Japan has not been operational since 6 December: It lost some of the water in the cooling circuit of the core due to the malfunctioning of a valve. It was a similar problem that triggered a release of radioactive steam, on 4 November last, at a Finnish power plant.

France has not been spared such disappointments. Last Autumn we learned of the existence of cracks at some points of some 20 reactor vessels. For reasons of economy the Edf had then decided, with the agreement of the safety authorities, not to delay the start-up of the Tricastin, Gravelines, and Dampierre reactors. However, a new problem appeared which, nevertheless, caused a delay: the failure of the valves on the cooling system whose purpose is to release residual heat once the reactor has been stopped. Such valves must open to release any pressure which may accidentally become excessive. It was found out in Gravelines that the valves did not always close once their mission was accomplished. This triggers the draining of cooling water which leaves the reactor core. This was an incident similar to that of Genkai and Three Mile Island.

"Ten years ago it was considered that the difficulty in nuclear resided in welding problems. Today, unquestionably, it is the problems involving valves and gates that are the most difficult to master," acknowledges Gaussens. The failing valves of French reactors are being modified. "However, henceforth, safety estimates and operational rules would have to take into consideration the fact that a valve may remain open," says Gaussens. The biggest mistake which was made by the Three Mile Island personnel was its failure to consider this possibility.

Neither worldwide hesitations nor technological obstacles influence the French government. In answer to the second petroleum crisis, it recently decided, as in 1974, in favor of a new acceleration of the nuclear program. In two years--1980-1981--the Edf will undertake the building of seven 1,300 megawatt reactors and three 900 megawatt reactors, or a total of 11,800 megawatts (the preceding rate was 10,000). Do energy requirements truly justify this decision? One year ago, the Peon Commission (consultative commission on nuclear energy) estimated that it would suffice to generate 6,000 to 8,000 megawatts, based on the probable hypothesis of a three percent economic growth. However, the government has decided to reduce as soon as possible petroleum imports (see interview with de Wissocq). The decision was properly

timed to keep Framatome in operation after its loss of the uranium orders.

The rise of petroleum prices has also been welcome in terms of strengthening the competitiveness of nuclear whose costs keep frustrating excessively optimistic hypotheses. In 1978 Peon assessed investment costs of a plant at 2,840 francs per installed kilowatt. Only two hypotheses were retained: A 10 percent cost reduction in the years to come or, at worst, an annual increase not exceeding 3 percent. Yet, from 2,840 francs in 1978, the cost per installed kilowatt has been officially raised to 3,500 francs.

Always optimistic, Peon estimates that by 1985 nuclear produced heat will cost 12.3 centimes, compared with 19.5 centimes for coal and 22.8 centimes for fuel. This assumes that the cost of nuclear would stabilize and that the French reactors would operate the number of planned hours, exceeding the average performance of American reactors. Furthermore, the cost is computed for "base" plants, whereas after 1985 the new nuclear plants will take over from fuel-powered plants, prematurely "graded down," to produce for the expensive "peak" hours. The more nuclear power plants are built, the more costly will the electric power they produce become.

Even though it objects to the formula (invented by the Edf as a publicity slogan!), the government has, nevertheless, gone "all nuclear." Before the end of the century, excluding the output of hydrolic power plants, all French electric power will be nuclear in origin. The wager is fantastic.

As a matter of fact, this huge program has been undertaken at a time when we know very little about the functioning of reactors built under American license. The first, accepted on the basis of a cautious pace, prior to the 1973 crisis, were completed two years ago in Fessenheim and Bugey. Cracks and failing valves have already been found and, following Three Mile Island, the risk of a severe accident cannot be excluded. The only studied scenario has been that of a sudden break in petroleum supplies resulting from a series of evolutions in the Gulf countries (see "La France sans petrole" [France Without Petroleum] Calmann-Levy Publishers). However, another equally likely "scenario-catastrophe" exists: France, 5 to 10 years hence, having lost one-half or two-thirds of its electricity as a result of a technical "fault," or an accident of sufficient gravity to justify plant shutoffs.

Between 1958 and 1973 France replaced coal with petroleum which accounted for the virtually entire growth of its energy requirements. This was an exclusive choice which is being deplored today. Yet, nuclear generated electric power has been assigned a similar objective. This is a heavy burden to be assumed by an economy which is already in

a state of crisis. The Edf already owes some 80 billion francs and will have to invest yet another 28.8 billion this year. To assess the French effort we must add the investments of the builders, the Eurodif cost (some 22 billion, nearly half of it paid by France), the planned cost of the expansion of the reprocessing plant in La Hague, and the budget of the Atomic Energy Commissariat (4.37 billion last year), one-third of which goes to industrial applications.

Such a mobilization of funds would be justified if nuclear is not to be a simple transitional answer to the current petroleum crisis but indeed the best answer to the energy crisis in the future. This is the core of the debate taking place in the industrial countries. This is what makes President Carter hesitate and, in France, divides political families. The majority has not been entirely won over by the choice of an essentially nuclear future. The communists would consider it favorably should it be "nationalized." As to the socialist party, this is the only problem on which it is divided in the adoption of its "socialist plans." With 17 percent of the vote, the Ceres option, similar to that of the PCF, was clearly defeated with the rejection of an "all nuclear" future.

What the majority in the socialist party rejects and, with it, the 22 organizations which expressed their views on 23 January last, is France's involvement in two new nuclear technologies loaded with uncertainties: the reprocessing of spent fuel and fast breeder reactors. Yet, without the use of these two technologies the nuclear choice is no more than a temporary answer to the energy crisis, for current reactors waste fantastic amounts of uranium. They consume no more than 0.7 percent of the uranium 235 atoms, the only fissionable ones, i.e., those which could split in two if bombarded by a neutron, releasing energy. The essential component of the ore, 99.3 percent of the uranium 238, does not break up under the impact of the neutrons; it is adsorbed and becomes plutonium.

Had there not been a worldwide delay in the implementation of nuclear programs, known uranium reserves would have been exhausted by the turn of the century. This deadline has been postponed while remaining inevitable. The French resources, assessed at 100,000 tons, would cover no more than 10 years of work of the national plants unless the "fast breeder reactor" is used. This is a surprising "boiler" which, theoretically, makes more fuel than it consumes and which uses the "waste of current reactors." The core, the energy producer, is plutonium, which is strongly fissionable. Uranium 238 spreads around the core a "fertile cover" which the neutrons released by the fission of the plutonium, turn into . . . plutonium. In principle, in the course of its life span, a fast breeder reactor would produce enough plutonium to feed a second generator and so on . . . ad infinitum. In practice we are still far from reaching such performances. Whereas, it should be given credit for using in full

the energy potential of the uranium, the fast breeder reactor has not as yet become a source of "perpetual" energy.

The first worldwide industrial prototype under construction at Creys-Malleville, 60 kilometers from Lyons, was scheduled to begin operations in 1983. Initially, the Edf was planning to make a decision, before that date, on the building of its successors. Now, having become more cautious, its management has announced that a decision will be made "before 1985." The fast breeder reactor poses technological problems whose size equals that of its energy performance. It uses a fuel which must be handled delicately, plutonium, six kilograms of which would suffice to make a bomb. It releases exceptionally high temperatures reaching 540 degrees centigrade. This raises unparalleled problems of material resistance which require the use of liquid sodium as a coolant. The sodium transfers its heat to water through the pipes of the steam generator; no escape can be permitted here, for sodium explodes when exposed to water.

"We have had to resolve one new problem per month," admits Michel Rosenholz, director general of Novatome, the builder. Only training under fire, the starting up of the reactor, would make it possible to learn if technological obstacles have been properly surmounted. Wisdom demands that we wait. This raises a problem with the "plan of attack" at Novatome and, even more so, among its subcontractors. "Before our subsequent plunge, we would like to draw all possible lessons from the building and the start-up of Super-Phoenix," says Remy Carle, Edf director. We also want to be sure that there would be no safety problem and that we have a site for the construction of at least two reactors. Above all, we must be sure on the subject of costs." Estimated at some six billion francs in 1976, Super-Phoenix will cost over 10 billion, for a generating power of 1,200 megawatts: twice the price of a uranium reactor. This is its major disadvantage. "Anticipating uranium price increase, we could accept a 20 percent cost increase but not a 100 percent," points out Carle. "The entire question is could we achieve this with a reactor as dependable and safe as Super-Phoenix?" The question faces Novatome which is scheduled to submit a plan to the Edf in 1982. "It will never be possible to prove that we should build a fast breeder reactor because it is competitive," Rosenholz believes. "All we can do is prepare proper documentation, reducing cost overruns to a minimum yet taking into consideration also the advantages of independent supplies."

The development of fast breeder reactors also comes against the feasibility and costs of reprocessing operations carried out by Cogema at La Hague Plant. To feed Super-Phoenix the used fuel must be reprocessed in the current reactors, i.e., the uranium must be separated from the plutonium and from the dangerous fission products which must be stored for millenia. This involves a succession of chemical operations which are theoretically simple. However, the high radiation activity calls

for their implementation on a remote control basis, in "glove containers" or behind huge concrete walls. The slightest incident, the slightest escape, the slightest repair would then assume the aspect of a lunar landing expedition and would stop plant operations for a number of weeks. Being the only one of its kind in operation in the world since 1976, La Hague has treated no more than 110 tons of enriched uranium fuel, sufficient for the production of one ton of plutonium, whereas five tons are needed for the first core of the Super-Phoenix. This has not prevented Cogema from signing contracts for the reprocessing of 6,000 tons of foreign originated fuel in 10 years. It is planning to double the capacity of the current plant to meet the requirements of the Edf and to build a second plant with a capacity for 800 tons per year to fulfill its foreign contracts.

Reprocessing is the most critical item of the French program. All British and American plants have had disappointments until the time that President Carter suspended reprocessing, believing that the production of plutonium would encourage the proliferation of nuclear armaments. A commission of international experts, assembled at his request, will submit its conclusions in February. We already know that it does not oppose reprocessing, believing that any nuclear technology involves a certain risk of proliferation. It remains to be seen if the reprocessing would not crumble under its own difficulties. "We are still facing problems but we have learned a great deal," answers Claude Aycoberry, in charge of reprocessing at Cogema. "We shall have less difficulties in the future if the fuels are planned from the very beginning with a view to reprocessing. So far this was not the case, having grossly underestimated reprocessing difficulties."

The result has been a spectacular rise in costs. In 1970 European experts assessed the cost of a plant producing 1,500 tons per year at 400 million francs. In 1975 the CEA estimate was some 2 billion. In June 1978 Mr Aycoberry gave the figure of 5 billion for a plant producing no more than 800 tons. His deduction was that the reprocessing of one kilogram of fuel would cost 2,900 francs leading to the production of uranium and plutonium amounts assessed at 1,400 francs: reprocessing had no longer become a profitable operation. Therefore, why pursue it?

In any case, reprocessing is indispensable in order to insure the full safety of the storage of fission products, the French say. This is contradicted by American and Swedish reports which consider that it is equally safe and infinitely less costly to dispose of irradiated fuel as such. What is certain is that reprocessing is indispensable for feeding the fast breeder reactors. Last year, however, Cogema's preliminary estimate for new plants called for twice the cost announced six months earlier by Mr Aycoberry. The problem currently studied is to determine whether, as was the case for the Super-Phoenix, costs could be lowered without detracting from dependability and safety.

One last major unknown remains: The fuel of the fast breeder reactors will have to be equally reprocessed to recover the plutonium they generate. This is an even more difficult operation the cost of which is even less known.

"Should reprocessing turn out to be really too expensive, there would be no fast breeder reactors," admits Carle. "Should the successors of Super-Phoenix produce energy as expensive as solar, it would be useless to pursue it."

However, focusing most of its means on the nuclear option, France risks finding itself quite impoverished in case of failure. "The international context will be decisive," Carle believes. "It would be very difficult to develop a line such as the fast breeder reactors if one is not confident that its future would spread beyond our own borders."

In addition to answering the real problems of energy dependence, the French nuclear option also provides the Atomic Energy Commissariat with the possibility for a requital. Following the drop of the French project, the CEA no longer had a great future at the point when Andre Giraud took over its management, in 1971. The development of reprocessing and of fast breeder reactors gave it a second breath while a French nuclear industry was under construction. Is this a good "loop-hole?" Following the start-up of reactors ordered after 1974, the start-up of the Super-Phoenix, and the continuing regeneration tests, the 1980's will show whether or not France has been able to impose to the world a technology which would eliminate for a long time to come the ghost of an energy shortage, or whether or not it would pay the heavy price of an excessively ambitious gamble.

The French Nuclear Program

Plant	Start-up year	Power	Total Corresponding Power
<hr/>			
1974*			
Bugey 5	1980	900	
Tricastin 1	1980	900	
Gravelines 1	1980	900	4,500 MWe
Dampierre 1	1980	900	
Tricastin 2	1980	900	
<hr/>			
1975*			
Gravelines 2	1980	900	
Dampierre 2	1981	900	
Tricastin 3	1981	900	
Gravelines 3	1981	900	5,400 MWe
Dampierre 3	1981	900	
Tricastin 4	1981	900	
<hr/>			

Plant	Start-up year	Power	Total Corresponding Power
1976*			
Paluel 1	1984	1,300	
Saint-Laurent B 1	1981	900	
Le Blayais 1	1982	900	
Gravelines 4	1981	900	5,800 MWe
Dampierre 4	1982	900	
Saint-Laurent B 2	1982	900	
1977*			
Le Blayais 2	1982	900	
Chinon B 1	1982	900	
Chinon B 2	1982	900	
Paluel 2	1984	1,300	4,900 MWe
Le Blayais 3	1983	900	
Super-Phenix	1984	1,200	1,200 MWe
1978*			
Le Blayais 4	1983	900	
Cruas 1	1983	900	
Cruas 2	1984	900	4,000 MWe
Paluel 3	1984	1,300	
1979*			
Cruas 3	1984	900	
Cruas 4	1985	900	
Flamanville 1	1985	1,300	5,700 MWe
Saint-Maurice-l'Exil 1	1985	1,300	
Cattenom 1	1986	1,300	
1980*			
Gravelines 5	1984	900	
Gravelines 6	1985	900	
Chinon 3	1986	900	
1981*			
Paluel 4	1985	1,300	11,800 MWe
Cattenom 2	1985	1,300	
Flamanville 2	1985	1,300	
Saint-Maurice-l'Exil 2	1985	1,300	
Belleville 1	1986	1,300	
Belleville 2	1987	1,300	
Nogent-sur-Seine 1	1986	1,300	

MWe: electricity megawatts

* Year in which the boiler order was placed.

The Atomic Industrialists

The Empain-Schneider has the lion's share of the implementation of the nuclear program. Creusot-Loire and its nuclear branch, Framatome (30 percent of whose capital is controlled by the CEA) account for 30 percent of the building of a nuclear plant. Currently, Framatome's personnel exceed 4,000 people. Among the other branches of the group Spie-Batignolles does the bulk of the public works; Merlin-Gerin supplies the electrical materials, while Jeumont-Schneider is in charge of the electrical engineering. Having adopted a single reactor model under Westinghouse license, the government has removed the CGE [General Power Company] from the nuclear competition. However, thanks to Alsthom-Atlantique, it is the exclusive producer of turboalternators, the "conventional" part of a power plant.

As to supplying of fuel, and the extraction and processing of uranium ore, it is split between Cogema (a 100 percent owned branch of the CEA), which is solely in charge of enrichment and reprocessing, and the PUK group whose Comwibrex branch converts uranium into hexafluoride.

The same participants are involved in the manufacturing of the fast breeder reactors assigned to Novatome, a branch of Creusot-Loire (36 percent), CEA (34 percent), Alsthom-Atlantique (15 percent), and Neyrpic (15 percent).

Mobilization of all National Resources. Interview with Francois de Wissocq, director general of Energy and Raw Materials

LE NOUVEL ECONOMISTE: Why has the government decided on a new acceleration of the nuclear program? Is it for energy reasons? Or else is it for keeping Framatome in business?

Francois de Wissocq: This decision is certainly advantageous in terms of industry. However, the prime objective is to reduce as soon as possible the consumption of petroleum products. We were planning to build only 1,300 megawatt reactors. We have added three 900 megawatt reactors to the program as they are quicker to build. We would like to lower the use of fuel power plants by utilizing a maximum amount of nuclear, hydraulic, and coal.

LE N. E.: Does this imply the enhancement of the coal policy?

F. de W.: On a worldwide level, we believe that a rise in coal prices would make the development of new mines competitive. This was not possible in terms of 1979 prices. In the case of France this could turn two basins and two only, profitable: those of Lorraine and of Provence, whose output is comparable to the good British and German mines. The other French basins, unfortunately, are being exhausted or else may retain excessively high mining costs.

However, what we would like to enhance is the utilization of the coal. This is difficult, for the coal industry has been replaced by the fuel industry. Practically speaking, promoting the use of coal for private heating purposes seems excluded. It would be far more conceivable for collective heat generators in which coal could advantageously replace oil and even gas whose prices, in all likelihood, will follow those of oil. We are considering, above all, the fact that some industries could be converted to coal. Cement plants have already done it. The chemical industries could do it. Our objective is to maintain and even slightly increase current coal use. To accomplish this we must find new users who would take over from the Edf as nuclear generating power rises.

LE N. E.: Nuclear, therefore, retains its priority. This does not seem to be a very diversified policy.

F. de W.: That is not correct. We are trying to utilize all national resources. The law on the recovery of lost heat will be debated in parliament at the very beginning of the next session. We have already initiated some projects with the refineries, for example. The rise of petroleum prices improves the profitability of heat recovery and of geothermal. We are also drafting a "biomass" plan, or a plan for "green energy," which will be made public shortly. I can already tell you that a better utilization of timber, without competing with other uses, would enable us to save four to five million tons of petroleum before the end of the decade. Collective thermal plants, using wood as fuel, could be built in the vicinity of forested areas.

LE N. E.: Would conversions to wood, coal, and electricity, and energy savings not face the general problem of low investments?

F. de W.: The industrialists have already become quite convinced that they must do everything possible to replace liquid fuel. In 1979 they spent three billion francs to save on energy, with a 400 million francs state assistance. All in all, in all sectors, six to seven billion francs were invested last year in energy developments, savings, or substitutions. I believe that our message is beginning to be heard and that the French people have understood that energy will be more and more expensive. Between 24 December and 6 January we conducted 7,000 investigations of temperatures maintained in premises. The average temperature was 17.3°C: This is well below the regulation 19°!

Nuclear Throttled Down

The first petroleum crisis gave no more than a slight whiplash to nuclear orders. The cumulative effect of the opposition and of economic difficulties is that by 1985 the reactors in operation throughout the world will be half the number planned in 1974.

There have been no orders placed in the FRG since 1975. Despite the wishes of Chancellor Schmidt, only two of the 12 installed reactors have been issued a final operations permit. The other 10, along with another 11 under construction, are following the bureaucratic process.

One year ago, Austria, the seat of the International Agency for Nuclear Energy, rejected the use of nuclear by referendum. The same procedure will be applied in Sweden, in March, and in Denmark, next year, to determine whether or not they will implement their programs. The Netherlands are planning a parliamentary debate in the course of which no party will put up a strong defense of the atom. Clearly reduced, the Italian program has been the victim of the country's political and economic uncertainties. In Europe, Margaret Thatcher alone is promoting nuclear. However, her ambitions have been limited to ordering one or two reactors per year, starting with 1983.

Even though it is importing virtually its entire amount of energy, Japan has lowered its ambitions for 1985 from 60,000 to 26,000 megawatts, which will leave its energy dependence on the 85 percent level. It is understandable that it would be the first country where the new rise in petroleum prices is encouraging the government to go nuclear.

In the United States, the strength of the opposition, the economic recession, the governmental hesitations, and the competition of coal have resulted in a crumbling of the number of orders. The "independence plan," formulated by President Nixon, called for 1,000 reactors by the year 2000: There are 72 currently in operation and 88 under construction.

Either because they have petroleum or are poor, or else have no electric power grid yet, or, else again, because they are considering the Iranian example, the developing countries are not providing the expected market. South Korea alone remains a serious client and French industry would be quite pleased to take the monopoly of its American competitors away.

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PCF, PS SHOW INTEREST IN NUCLEAR POWERPLANT LEAKS

Paris LE MONDE in French 25 Jan 80 p 15

[Article by Rene Moirand: "After the Radioactive Leaks in La Manche the Elected Socialists and Communists Show Interest in The Hague Nuclear Powerplant"]

[Text] Cherbourg--After the Cherbourg Municipal Council and the information mission established within the regional council, it is the council general of Manche, through its nuclear delegation, which discussed the consequences of the leaks discovered in the drainage system of The Hague plant, during a meeting held on Tuesday, 22 January, in the prefecture.

The management of the nuclear powerplant was accompanied by Professor Marc Doucet, from the Central Service for Protection Against Ionizing Radiations, who gave assurances that the dosage levels observed in the meat of shellfish caught near these leaks had remained extremely low. "I am ready to eat such shellfish for a year. The risk to me is comparable to that I would take by leaving Paris to go to Brittany to spend a couple of weeks. The banning of fishing would be equivalent to forbidding a Parisian living on the ground floor from going to live on the 30th floor of a tower," Professor Pellerin's assistant told the press.

These reassuring words did not keep the Manche federation of the Socialist Party [PS] from wishing for an investigation committee made up of elected representatives of plant personnel, associations in defense of nature and scientific specialists to be constituted to discuss the problems of The Hague plant on site before publication of a report. A meeting was to have been held on Friday, 25 January, at the initiative of the socialist elected officials from Manche, who will receive in Cherbourg Paul Quiles, national secretary of the PS responsible for energy problems; Louis Darinot, socialist deputy of Manche and mayor of Cherbourg, will on the same day talk with spokesmen of The Hague CFDT [French Democratic Confederation of Labor] local.

Known for their fight against pollution of the seas in general and their activities against seal and whale hunters, ecologists of the Green Peace

Movement arrived in Cherbourg harbor on Tuesday to hold a press conference aboard their ship, "Le Combattant-de-l'Arc-En-Ciel" [The Rainbow Combatant], this Thursday, 24 January, with representatives of the CFDT regional committee, the anti-nuclear campaign and the anti-atmospheric pollution committee in The Hague, to announce a symbolic demonstration at the time of arrival--which they consider imminent--of a new shipment of radioactive fuel from Japan and to attract the people's attention to the dangers such shipments represent.

Since 21 January, the radioactive leaks discovered 15 days earlier in the drainage system which dumps wastes from the reprocessing of nuclear fuel from The Hague into the sea had resulted in an unexpected initiative. Led by Louis Darinot, the socialist and communist elected officials from Cherbourg were, in fact, received on the site of the nuclear power plant, whose installations they visited for the first time. Accompanied by two regional councilors of the majority, Messrs Aguiton and Duduit, Darinot was also able to demand explanations from the plant director, Maurice Delange, who has just been appointed to the regional economic and social council.

Unlike the majority of the councillors general from Nord-Cotentin and the elected officials of The Hague, the union of the left municipality of Cherbourg had not judged it worthwhile until this day to respond to the invitation which the management of the nuclear power plant had extended on a continuing basis to elected officials. For their part, the regional councilors on this occasion inaugurated the new information mission approved on Saturday, 19 January, at the request of Darinot, who was named its head.

The safety of shipments of radioactive fuels, the storing of the "fission products," site surveillance and discharges of waste into the marine environment and the atmosphere were the subject of courteous debates between the plant management and the municipal councilors of Cherbourg who were visibly impressed by the precautions taken but who expressed their amazement that a technical problem apparently quite easy to resolve should be posed with regard to the reliability of the drainage system into the sea.

Suspected of not having supplied enough information, the management took the opportunity to mention to the socialist and communist elected officials that they had waited 3 years to come on site in search of such information: "One does not answer figures with states of mind. The facts and figures are kept on a permanent basis by the Ministry of Health and everyone can obtain them at the Departmental Office of Health and Social Action," Delange added. However, the latter restricted himself to stating that the radioactivity discovered as the result of leaks in the drainage system had not in any event reached the maximum permissible levels.

A 5-Hour Visit

As regards this drainage system, which is tested regularly with ultrasonic waves and is suspended from supports formed of piles driven into the seabed

to facilitate inspection, The Hague management continues to say that there are no signs of abnormal aging, except in the tidal action area where it is more vulnerable because of the movements of stones and pebbles. That is not the opinion of the CFDT which feels it necessary to replace the drainage system from one end to the other.

In the laboratories, the elected officials were invited to see, and even touch if they wanted to, fresh seaweed gathered in the polluted region by the antiradiation protection service. The test seaweed-Corallina officinalis--which best concentrates certain radioactive elements cast off by the plant played its role as an alarm bell, the chemists said: its radioactivity, at the beginning of the month of January, had, in fact, increased 100 percent compared to normal. The elected officials left the plant satisfied, it seems, with the explanations received, but without knowing how to translate for the people their "states of mind," at the end of a visit which lasted over 5 hours.

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FRANCE

BRIEFS

NEW ZEALAND REPORT OF EXPLOSION--Wellington, March 3 (AFP)--France exploded a nuclear device at Mururoa Atoll on February 24, New Zealand science and seismological observations have confirmed. The records show a nuclear device of less than five kilotons of power was exploded by France at its underground test site. This was one of the smallest blasts ever recorded from Mururoa. The scientific record of the blast showed only minor movement and was initially missed by New Zealand scientists checking the details. Earlier reports from Tahiti claimed the test was of great power. New Zealand Government scientist [words indistinct] France had exploded the nuclear device at seven in the morning New Zealand time. It is understood only one test of smaller size has been recorded by New Zealand. Dr Smith said France had exploded devices of much greater force in the past with at least one having more than 100 kilotons of power. Dr Smith confirmed the previous nuclear test by France at Mururoa had been recorded on November 22 last year. [Text] [OW030249 Hong Kong AFP in English 0045 GMT 3 Mar 80 OW]

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NETHERLANDS

GOVERNMENT AGREES WITH EC NUCLEAR PROGRAM

Rotterdam NRC HANDELSBLAD in Dutch 6 Feb 80 p 15

[Article by Sytze van der Zee: "Netherlands Agrees With Nuclear Energy Program in the EC"]

[Text] Brussels, 6 February -- Even though the Netherlands has, in principle, approved three programs of the European Commission with regard to nuclear energy, it is keeping its options open. During an EC Council of Ministers meeting in Brussels yesterday, the Netherlands stated that this does not mean that a final choice has been made for the Community as a whole in terms of, for example, the development or use of breeder reactors on an industrial scale.

Therefore, an acceptance of the programs as such would not, at this time, have any effect on energy policy in the Netherlands. The programs relate to radioactive waste products, the reprocessing of irradiated fission materials and the fast breeder reactor as possible choices. In this context, it was pointed out by the Hague that, based on government proposals, an extensive public debate about future nuclear policy will be held during the next 2 years in the Netherlands.

Thereafter, a final decision process will take place only at a later time. In the light of this, it may be possible that the Netherlands would no longer be able to participate in all three programs.

No agreement was reached yesterday about the European Commission proposal once again to grant more than 110 million guilders in interest subsidies for structural measures in the steel sector. Proponents of this were the British and the Belgians who want to reorganize and modernize their steel industry this year.

European Commissioner for Industry Davignon yesterday also insisted on a quick decision. But the West Germans felt that the amount requested by the Commission was much too high. They let it be known that they do not want to go beyond 75 million guilders. Finally, it was decided once again to submit the whole matter to the permanent representatives of the EC countries in Brussels.

NETHERLANDS

CHAMBER DISCUSSES CLOSING OF NUCLEAR POWER STATIONS

PvdA Members Favor Closing

Rotterdam NRC HANDELSBLAD in Dutch 20 Feb 80 p 3

[Text] The Hague 20 February--The PvdA [Labor Party] group in the Second Chamber is sharply divided about the continued use of nuclear power. A considerable part of the group--it is described as a large minority--wants to close the plants in Dodewaard and Borssele.

In the preparation of the chamber discussion of the Harrisburg incident, 17 of the 42 PvdA group members present voted against the majority idea of keeping both of the plants open. The group considered the number of dissenting voters remarkably large.

The minority shares the view of the party congress which advocated last year the shutdown of both plants "as soon as possible." Party chairman Van den Berg laid strong emphasis just this week on the closing of Borssele and Dodewaard.

The majority of the group is of the opinion that public discussion of nuclear power should not be frustrated by a premature judgment and is apprehensive about the economic and financial results of a shutdown. Moreover, the majority does not see any reason to close both plants for safety reasons.

The minority claims that keeping both plants in operation will inevitably create a waste problem. The group member, K. Zijlstra--who supported the minority view in the group--says that continued operation of the plants will produce waste

which will remain in the Netherlands (through compact storage at the plants) or will return (from the processing plant in Frankfort). He says, "whichever way you turn, what you produce now will remain in the Netherlands and you will saddle future generations with it."

Chamber Against Borssele/Dodewaard Closing

Rotterdam NRC HANDELSBLAD in Dutch 21 Feb 80 p 13

[Text] The Hague, 21 February--The majority of the Second Chamber does not feel inclined to shut down the nuclear power plants in Borssele and Dodewaard. A PPR [Political Party of Radicals] motion to close the plants is only getting support from the PSP [Pacifist Socialist Party] and a minority in the PvdA group. The CDA [Christian Democratic Appeal] and a majority of the PvdA and D'66 [Democrats '66] do not see in the existing safety situation at the two Dutch nuclear plants any reason for closing at this time and want to wait for a decision about that until the conclusion of the public discussion of nuclear power. The VVD [People's Party for Freedom and Democracy] simply favors keeping the nuclear plants in operation.

The Second Chamber discussed yesterday the results of the accident with a nuclear plant in Harrisburg, U.S. However, as Mrs Lambers-Hacquebard expressed it, it became rather a discussion about Borssele, rather than looking at statistics about Harrisburg. The majority of the chamber thinks that Dutch nuclear power plants are safer and more reliable than the one in Harrisburg. Still, there exist, among others, for example the CDA member Van Houwelingen, some questions about the organization of crisis control in cases of nuclear accidents in the Netherlands. It appears especially from the reports of the "near disaster" in Harrisburg that something was certainly wrong in the United States, as a result of which a large scale panic could develop.

The CDA thinks (moreover, just like the VVD and a majority of the PvdA) that the risks for the population from the two Dutch nuclear power plants are not unacceptable. However, the PvdA and D'66 want, more than the CDA, to prevent the government from anticipating the result of the energy discussion by keeping Borssele and Dodewaard in operation.

Contracts

According to PvdA spokesman, A. Voortman, that threatens especially to happen with the bill which envisages the approval of the processing contracts which PZEM [expansion unknown] has concluded with French and British firms for nuclear waste from Borssele. According to the PvdA, with the ratification of this agreement, the continued operation of Borssele could be expected until the distant future. The entire PvdA group is against that.

D'66 also opposes the approval of those contracts, as long as the international study of a safe system for plutonium storage (which is released in processing) and public discussion are not completed. For that matter, the chamber approved a D'66 motion to that effect in June 1979. Minister Van Aardenne (economic affairs) meanwhile indicated that failure to approve those contracts, as a result of which all the nuclear waste must remain in Borssele and Dodewaard, will lead inevitably to the shutdown of both plants.

However, the Second Chamber also does not want to approve the contracts because Borssele will get back after 1990 and in emergencies all the nuclear waste which is released in processing in France. The French Cogema plant stored this waste itself until the end of 1979.

The CDA also is holding out for an assessment of the international studies of processing and plutonium storage before a decision is made on processing contracts with France and England.

Compact Storage

A chamber majority (CDA, VVD and the majority of the PvdA group) is ready to pass the bill which increases the opportunity for the storage of processed fuel elements in Borssele. The PvdA wants the so-called compact storage, in which the irradiated fuel rods are immersed, closely packed together, in a basin to cool down. However, it wants to limit that storage capacity to the fissionable material rods, which come from the reactor in fuel exchanges in a maximum of 3 years. A D'66 motion against allowing such compact storage (because Borssele now has sufficient storage capacity) was only supported by the PSP and PPR.

In the evaluation of the events in Harrisburg, many questions arise in the chamber about the reliability of Dutch safety

studies, such as those of Rasmussen and the Reactor Safety Committee. Concern especially prevails about the results of human failures. For it was definitely established from reports about Harrisburg that besides design faults and inadequate regulation and control systems in the plant, human failures, especially at the crucial moment, played a critical role. For these reasons, various groups insisted on very thorough training and great expertise for the personnel of Dutch nuclear plants. They also pleaded emphatically for the greatest possible frankness and the most complete information possible in the cases of breakdowns in nuclear plants.

According to PvdA member, Voortman, "Harrisburg has undermined the claim of exclusive expertise and infallability which seemed to be characteristic for a long time in the Netherlands of those directly involved--for example, the electric power producers--and indirectly involved, such as official inspection agencies.

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SWEDEN

BRIEFS

NEW TEST BORING--In the spring, test boring will be started in the rock in Bohuslan to find out whether that is a suitable place for the final storage of spent nuclear fuel and other radioactive waste. The government is expected to give the go-ahead signal soon for investigations which are to be carried out by the Swedish Geological Research Organization (SGU) on behalf of the Radioactive Waste Program Council (PRAV). Kynnefjall, in Bohuslan, is one of the ten areas in Sweden which are to be investigated during the 1980's. The SGU will begin boring in Kynnefjall in March 1980. The land is owned by Domanverket, which will be informed regarding the principles governing the boring of the holes. The experiments in Kynnefjall will cost 4 million kronor. Six holes are to be bored to a depth of from 300 to 600 meters. In addition, two shallower holes (100 meters) are to be made.

[Text] [Stockholm DAGENS NYHETER in Swedish 20 Feb 80 p 10] 9266

CSO: 5100

END

SELECTIVE LIST OF JPRS SERIAL REPORTS

WORLDWIDE SERIAL REPORTS

WORLDWIDE REPORT: Environmental Quality
WORLDWIDE REPORT: Epidemiology
WORLDWIDE REPORT: Law of the Sea
WORLDWIDE REPORT: Nuclear Development and Proliferation
WORLDWIDE REPORT: Telecommunications Policy, Research and Development

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